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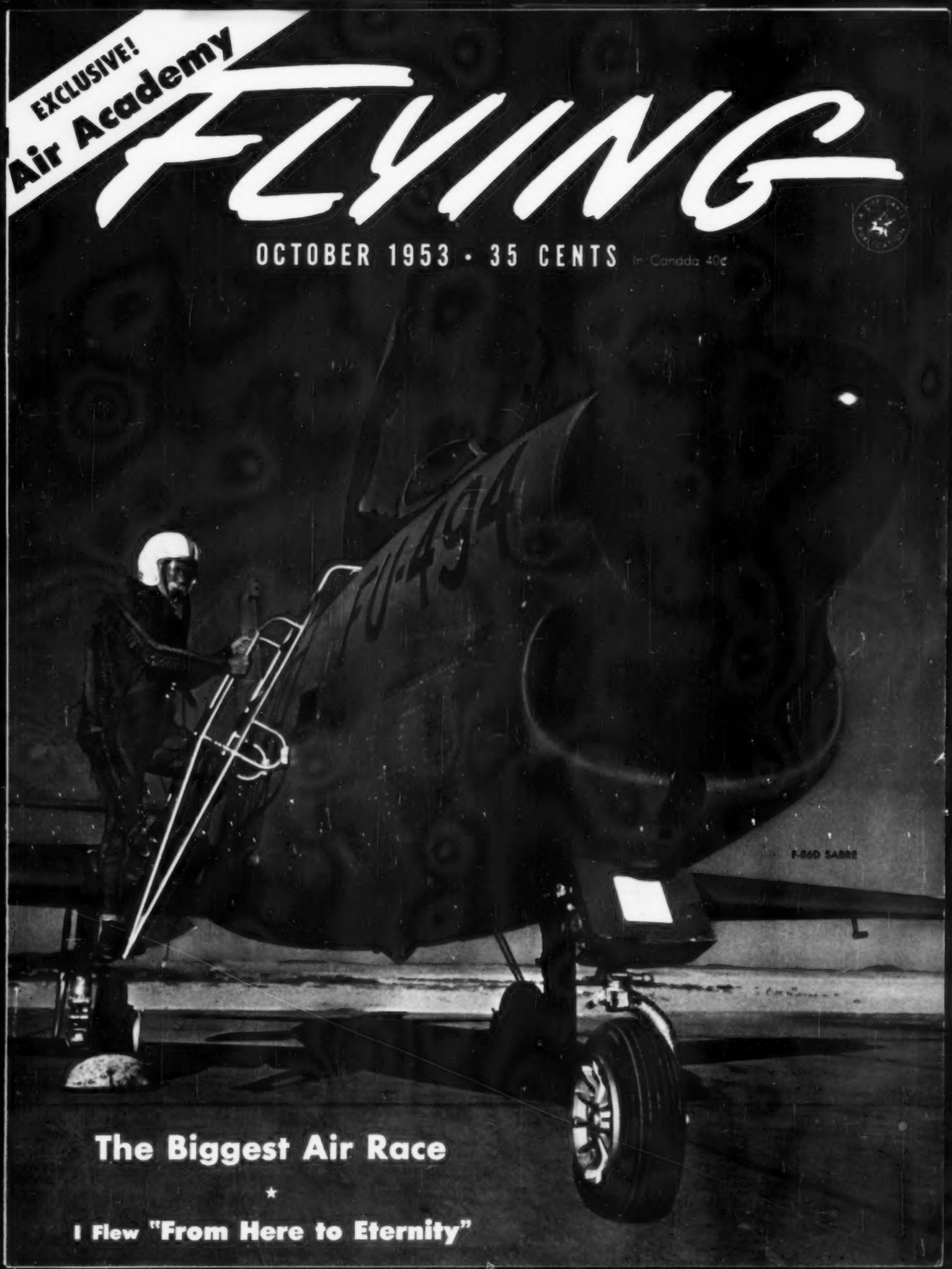

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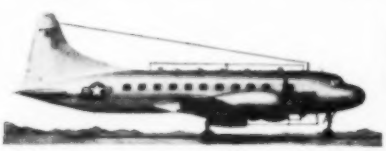

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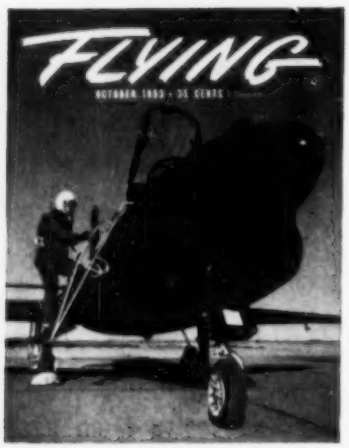

THE COVER: North American F-86D *Sabre* jet, radar-equipped interceptor.

CONTENTS

The Airman's Heritage, *An Editorial* 12
Air Academy . . . . . *Col. Dale O. Smith, USAF* 14

The Air University's Director of Education reviews problems and prospects for an air counterpart of West Point and Annapolis.

I Flew "From Here to Eternity" . . . *Maj. Vernon Flake, USANG* 16
The Biggest Air Race . . . . . *Peter M. Bowers* 18
Readin', Writin' and RPM's . . . . . *Peggy Phillips* 20
Russia's Secret Bomber? . . . . . *John W. R. Taylor* 22
Genealogy of American Aircraft—FAIRCHILD *Gill Robb Wilson* 23

To dramatize the thinking and planning . . . the scope and sweep . . . the continuity and growth of American airpower, FLYING *Magazine continues its series tracing the family trees of the air industry.*

Pictorial Computers . . . . . *James Holahan* 26
The Slingsby Sky . . . . . *J. C. Reussner* 28
The Pros Join the Team . . . . . *Norman Sklarewitz* 30
Weather All the Way . . . . . *Beatrice Edgerly* 32
Oxygen Lack . . . . . *Michael Denver* 33
Dust Is Their Destiny, *The Air Age at Work* . . . . *James Joseph* 34
Patrick Henry Airport . . . . . *William W. Neale* 36
I Learned About Flying From That! No. 165
Maj. William R. Fuchs, USAF 37

IN THE NEWS

Destination St. Jovite
Page Shamburger 39
New Terminal for Newark 41
Challenge to Power Pilots 48
Souvenirs of Detroit 50
All Planes Accounted For
Viola Grossman 56
Postmaster Wins Air Cruise 60

FLYING FEATURES

Mail Box 6
CAP Wing Talk 38
Flying Farmers . . . *Bill Renshaw* 40
NATA Operators Corner 42
AOPA NEWS 46
Photo Credits 54

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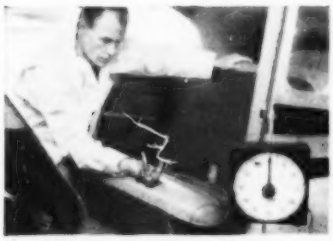

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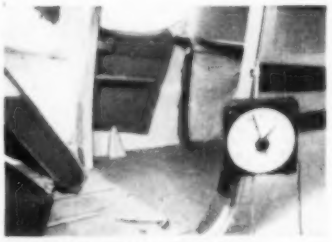

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MAIL BOX

THE KID BEAM

I like your editorials and the one in the July issue about "Grandmother" is no exception. In my 16 years of flying I, too, have gathered together many memorable experiences to think about.

Last January I had an extra week's vacation and decided to go to Florida. I took my wife and three sons with me. We have twins aged 10 years and our other little fellow is nine. If Barnum and Bailey think they have fun moving their circus around, they should try going on a 12-day, 3,000-mile vacation with a wife and three lively boys in a Piper *Clipper*. I don't believe any family ever had a more wonderful vacation, and my wife admits it, too.

We had two sets of sectional maps. One set the boys and I glued together. We drew our course on this big map and then by cutting off all except about nine inches each side of our course we had a long map which could be folded like an accordion and easily handled in the airplane. There wasn't any radio in the *Clipper*, but I always knew just where we were—the kids kept telling me!

Do you suppose I'm the first pilot to fly the Kid Beam? It certainly was the Fun Beam!

ERWIN E. STOCKWELL

Orange, Mass.

ENCORE FOR SANDUSKY

I read with interest the letter in the August Mailbox entitled "Plug for Sandusky."

I had occasion to land at Mr. and Mrs. Griffing's airport about three years ago when caught at dusk on a trip from Muskegon, Mich. I was treated in every respect the same way as the Palmers and reading their article made me a little ashamed that I had not offered my little bouquet, also.

It certainly is a pleasure to meet people like the Griffings (and there are others like them at the small airports) and I look forward to setting my wheels down at their port again.

STANLEY M. PIERCE

Clementon Airport
Clementon, N. J.

OPPORTUNITY IN CANADA

I recently made a trip to Canada to enlist in the RCAF for pilot training. Upon passing the entrance examinations I was told that because of the McCarran Act I would have to have written authorization from the U. S. State Department and Defense Department before the RCAF would accept me.

I applied for the necessary authorization but was turned down on the grounds that present policy was not to grant the authorization in an individual case. However, the letter indicated that consideration would be given to an application from a group. I am sure there are others who would like to join the RCAF and if they would contact me we could all get together and make application as a group. The RCAF requirements for aircrew training are: age 17-24, high school education, and citizenship in one of the NATO countries.

I believe that Americans who cannot meet the USAF requirements for pilot training can be of service to the U. S. as well as Canada as pilots in the RCAF.

HENRY MALONE, JR.

Box 272
Poteet, Texas

WE STAND CORRECTED

In "Dear Son—Dear Mother" (FLYING, July), Peter M. Bowers writes: "With the exception of one specialized single seater, there is not a 65 hp airplane being built in this country today."

This is not true. I, as a dealer for Taylorcraft, sell a very fine two-place 65 hp airplane ($3,060).

EDWARD R. HUMPHREY, JR.

Brooklyn, N. Y.

SERI RECOLLECTIONS

"Trouble over Tiburon" (FLYING, July) held special interest for me. My father was the first person to make peaceable negotiations with the Seri Indians. Later my mother and I (age 4 or 5) became "blood members" of the tribe. One evening in 1910 or 1911 we showed most of the tribe their first movies when the whole gang showed up for a visit.

When next we saw them at Kino Bay Dad asked my old nurse, then about 75 years old, if she knew "that hombre over there." She shook her head, "No." But how she jumped up when she heard I was "El Bebe." This was about 1926.

Dad made several trips hunting rare cactii for the University of California at Berkeley and sailed over to Tiburon where he not only found several brand new cactii that he was privileged to name but also was given one of the ollas from the sacred cave of their gods.

S. H. PARSONS, JR.

South Gate, Calif.

ANSWERING THE ADMIRAL

In reply to "The Admiral Sounds Off" (FLYING, July) I'd say that the pilots the armed forces are missing are in high schools all over the country. They're the high school graduates who are not going to college.

During World War II, our armed forces were taking high school graduates as aviation cadets. I'd venture to say that the majority of them were as good as the pilots who were college men.

Several of the boys in my class which graduated this June would like to be Navy pilots. Most of us never will become military pilots because the educational requirements are too high. (I was the only pilot or student pilot in my class.)

If the Navy would take high school grads as aviation cadets, I'd get out of the Naval Reserve (R) and sign up in a minute. So would several others in our Reserve unit here.

ROLAND E. GARNER

Greenville, Miss.

May I ask what is the logic in saying that because a man has two to four years of college he wants to, or can, fly? Don't get me wrong. I'm not condemning a college education. I sincerely wish I had one. But when I left the Marine Corps in 1949 I used my G.I. eligibility to get my A&E ticket and start on my private license. Since that time I've continued on my own toward a commercial and instrument ticket—and at today's prices you know what that means.

But evidently this interest does not mean I can or want to fly, for when approaching a Navy or Air Force recruiting station all they know is: "Sorry, you can't handle an aircraft if you don't have a degree." This has happened many times in the past two years of our so-called emergency.

I am 23, have been in aircraft flight line work since 1949, have considerable flight experience and at present am probably making more money than I would in the service. But I'd be willing to make the change if the service would.

This, I believe, is not just my gripe, but that of many young fellows in the country with a high school education and a deep desire and ability to fly.

Until the services realize this, I'm afraid they're going to have to live with their pilot shortage.

ROBERT STAHL

Edwards, California

Admiral van Deurs' article was very good and so true and frightening. Where can the Air Force and Navy get pilots unless there is a large backlog of air-minded people in the country? And how do you get air-minded people unless they fly in small planes. Riding in a large plane is about like riding in the Fifth Avenue Bus after you have driven a private car with power and handling thrills.

I think Admiral van Deurs' idea of giving a free ride is very good. In fact I think I will steal part of the idea and when the school term starts this fall run a contest in one school at a time among students who are old enough to get an automobile operator's license. For the three best letters on auto accident prevention I'll give a free flight over Troy.

This should make them think about saving a few lives on the highway and will also get them air-minded.

WALLACE E. CHAPMAN

Melrose, N. Y.

A Salute

TO THE LOW-FLYING MEN!

All hail to the ace in the "wild blue yonder" . . . but let's give with some man-sized cheers for the lads who slug it out at hill-top level. From the time they take off . . . till the mission is completed, these strategic fighter bombers and tactical close support pilots face a brutal blasting all along the way.

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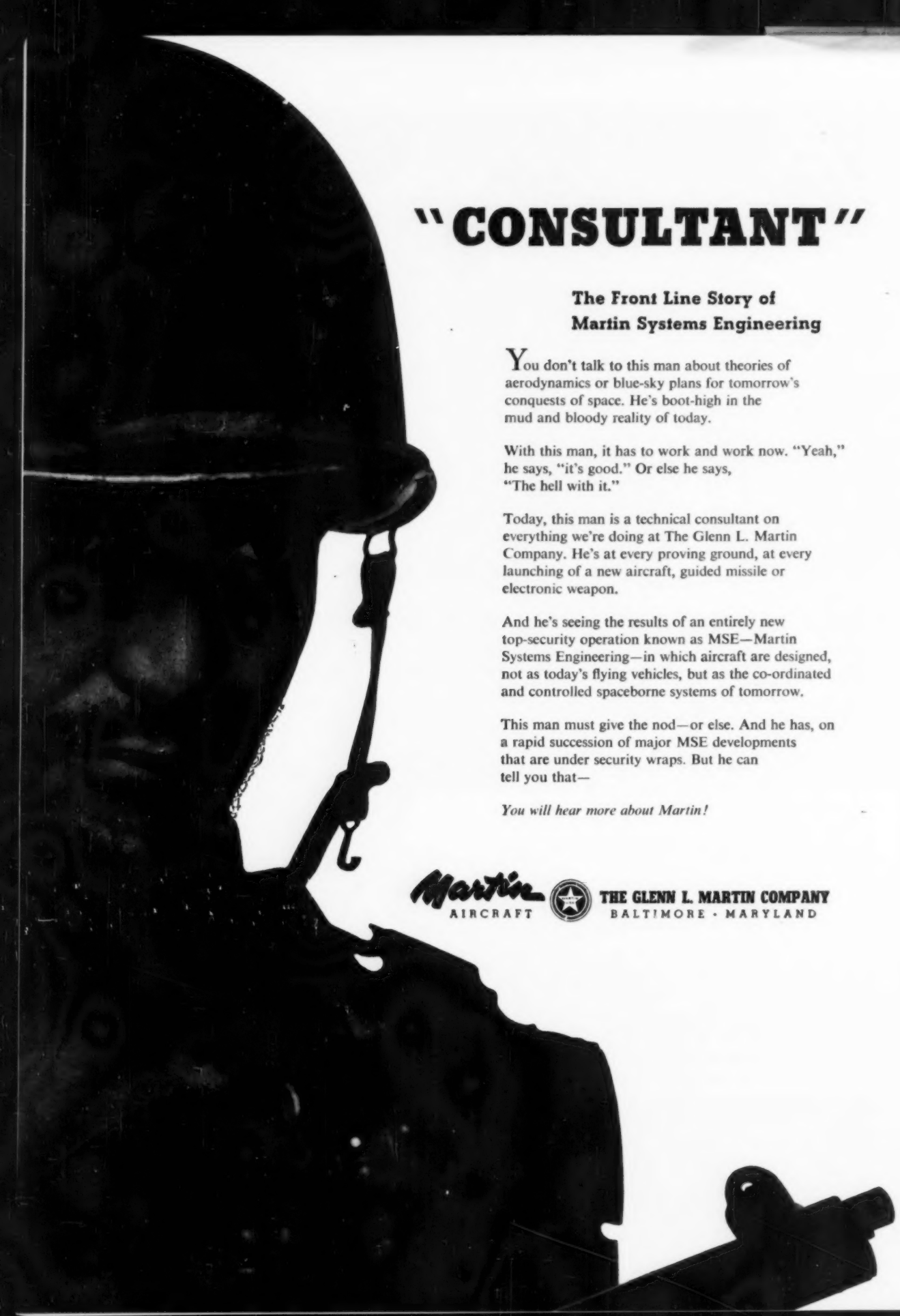

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FLYING
VOLUME 53, NO. 4
OCTOBER, 1953

AN EDITORIAL

The Airman's Heritage

OF ALL editorial chores on this magazine the one requiring most midnight oil is the reading of several hundred manuscripts which each month arrive in the mails. Unable to use more than a fraction of the total, our obviously easy solution would be to attach rejection slips to the vast majority of articles and let it go at that.

But we disdain that procedure because nine-tenths of the articles submitted are more than a writer's attempt to make an extra buck or achieve a by-line. They are in great majority the sincere sharing of knowledge and experience gained the honest way by a solid cross-section of airmen ranging from student pilots to aces, and from grease monkeys to Admirals. They are not always literary masterpieces, but they are heartwarming, and down-to-earth and helpful. So we digest every one of them and write personal rather than form letters to the authors and thank the Lord for the quality of people who are interested in one another.

Yet there is a uniqueness above and beyond that of fraternity in this wealth of articles which flows over our desk. This uniqueness can be summed up in the word patriotism. For some reason the vast majority of airmen have an exceptional concern for their Country.

I spoke of this to one old pilot recently at the Detroit Air Exhibition. "Yes," he said, "I've noticed that fact, and I attribute it in some measure to the nature of a pilot's experience. His work involves the breadth and depth and sweep of the land and so leaves its brand on his thinking."

A few days later I had a chance, at Strategic Air Command headquarters in Nebraska, to question some of the long-range pilots. "Did flying direct their attention toward the land as a whole?" They agreed that such was the case. "You just can't spend much time up there barreling around over it all and not realize that it's the world's greatest inheritance," commented a crewman.

On another occasion recently a businessman pilot put it another way. "You know," he remarked, "this country was made possible by folks who had a quenchless urge in them for the faraway places. They left their names and their bones all across the land, and all my life I've read about them and wished I could share their pattern of life. Then one day I took up flying and gulped up big doses of landscape and got to know a lot of country firsthand. That did something to me . . . sort of gave me a sense of possession and I began to feel that the Country's problems were my problems."

Nor can I forget the lad whom I once took to an airport outbound for the Pacific in 1942. He had been the kind who played a uke and was always getting skinned up in motorcycle accidents and showing symptoms of irresponsibility. We sat there chatting about his job as a Navy pilot and I jokingly remarked that I didn't know whether to feel sorrier for the Navy or the Japs. And suddenly he sobered and said, "Yep, I've raised a lot of cain but the flyin' has done something to me . . . kind of shows me what it's all about, I guess. You watch my smoke."

There seems no doubt about the fact that flying has been more than a physical experience among those who are extensively acquainted with it . . . not only as airmen but as passengers. It is an experience in mind and spirit as well.

And if this is the case, should not more be made of the fact? I've heard good arguments for aviation education from a lot of different angles—job opportunities . . . broadened vision . . . cultural development. All of it is doubtless on the beam. But it seems to me that the best of aviation education is getting up there and flying for what it does to you mentally and spiritually.

Anyone who flies will testify that numberless gateways have thereby been opened to their intellectual and spiritual ambitions. The very fact of pitting yourself against the requirements of flight is a long step toward the self confidence which is required for success anywhere.

Let us not be afraid to speak of these things when we present the cause of aviation to our youth. If the mastery of wings breeds a love of freedom, a sense of valued heritage, a kinship with those who have sought faraway places, why should we not say so? It is in this that flying excels so largely over any other experience available to modern youth.

Gill Robb Wilson

Gill Robb Wilson
Editor and Publisher

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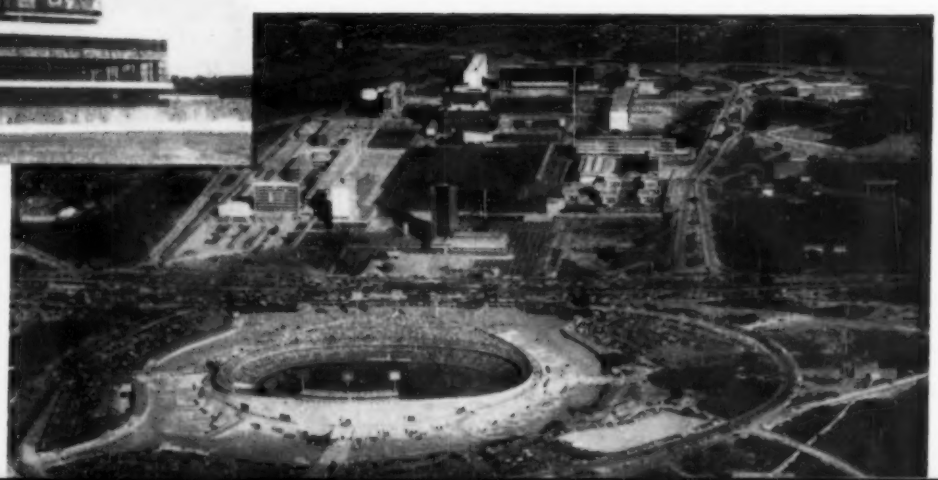
Air Academy

Where will the Academy's airfield be located? *Above* is a wartime view of the busy flight line at Randolph Air Force Base, Texas, known unofficially as the "West Point of the Air."

Below is a glimpse of the spectacular new University of Mexico, visited by a survey board from Maxwell AFB in Alabama in the quest for ideas for a U.S. Air Academy. Immediately below rises the tower of the library, while the lower picture affords a general view of the Mexican campus with stadium in foreground.

By COLONEL DALE O. SMITH, USAF
Director of Education, Air University



Maxwell Air Force Base (right) is headquarters for the Air University.

Mexico's splendid university provides fresh inspiration for planners of a U. S. Air Academy —when . . . and if . . .

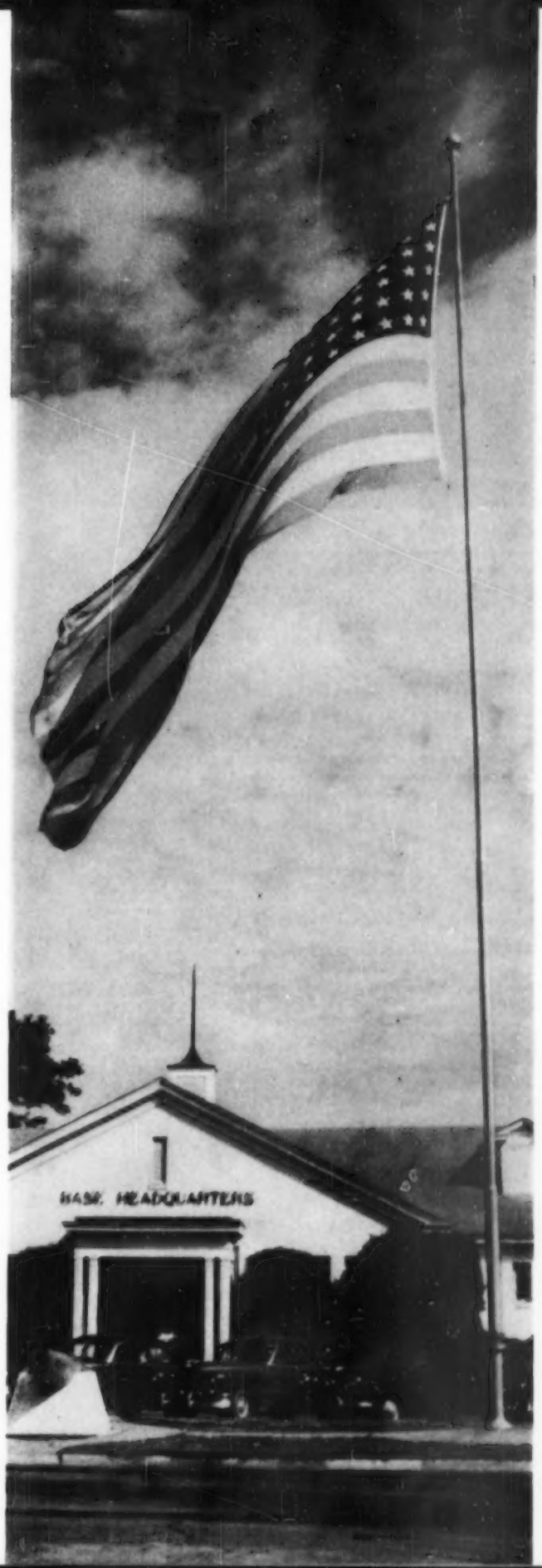
Opinions herein expressed are solely those of the writer and are not to be construed as those of the United States Air Force.

AS THIS is written, the author is in Mexico City with a delegation of fellow officers of the United States Air Force to study the new campus of the University of Mexico. Reported to be the most striking campus in the world, Ciudad Universitaria, or University City, has been constructed from the ground up as a complete academic community.

Since the Air Force will face a similar project in the development of its proposed Air Academy, it was felt the achievement of our friends south of the border might have valuable experience to be shared. And indeed such is the case. Situated outside Mexico City, the University campus is undoubtedly a fitting expression of the national aspirations and cultural attainments of the Republic.

The founding of an Air Academy in the United States at the earliest possible time is certainly essential to any concept of national airpower. As far back as 1928 the late General "Billy" Mitchell made official presentation of the matter. Mitchell described such an Academy as a vital long term investment in national security. Nor over the years since 1928 has there been any serious disagreement with that viewpoint. Yet somehow the founding of the Air Academy has always had to give way to more immediately pressing matters. This may have been a blessing in disguise because it has afforded the Air Force ample years for study and planning on the ultimate founding.

In any case it can be truly said that now the Air Force is ready for its Academy. President Eisenhower's endorsement has been given. The Congress is fully aware of the necessity of the institution. There is ample reason to feel that at last all the essential elements are (*Continued on page* 62)



Planes come in over the quadrangle at Schofield Barracks, with Cole Cole Pass at extreme right. Jap planes used pass Dec. 7, 1941.

I flew

By VERNON FLAKE
Major, U. S. Air National Guard
AS TOLD TO
BREWSTER MORGAN

A "Zero"—one of the National Guard's T-6 aircraft camouflaged with Japanese markings —swoops down low over the barracks target.

Burt Lancaster (center), star of "From Here to Eternity," poses in friendly fashion with his film "foe"—Maj. Flake and Capt. Harris.

WHEN they asked me to fly for the filming of "From Here to Eternity" I snapped at the opportunity. When it was all over I decided the life was not for me as a steady diet. The pay may be good, but it can't compensate for the gruelling hours in the air and the chances you are expected to take as a matter of routine.

As soon as Burt Lancaster, the star of the picture, and the Columbia Pictures film unit with a large group of technicians arrived in Hawaii, the Director got in touch with us at the 199th Fighter Squadron, Hawaii Air National Guard. The Department of Defense had been contacted previously and had offered complete cooperation. We were to furnish our T-6 airplanes, doctored with Japanese insignia and nose spinners. When the job was completed we had a reasonable replica of a Japanese *Zero*.

The first scenes leading up to the attack on December 7, 1941, were filmed at Schofield Barracks in the center of the Island of Oahu, about 10 miles northeast of Pearl Harbor. When called to report for our scene shooting, we took our planes to Wheeler Field, which adjoins Schofield, and met with the technical staff for a pre-mission briefing. In the group was a short stocky fellow named Wolfe, the explosives expert. He explained the effect he wanted to produce, and he had a man-sized war at his fingertips, too.

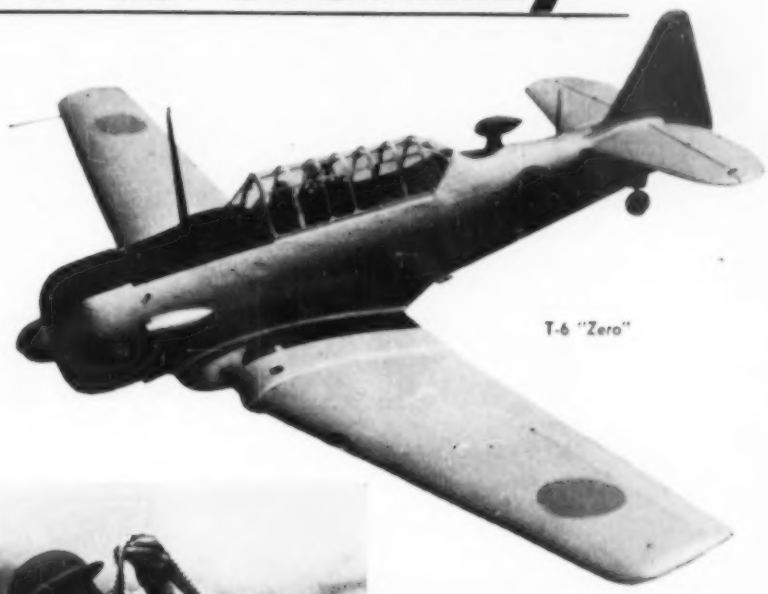
The elevation of Wheeler Field is (*Continued on page* 41)

"From here to eternity"

Realism knows no limits

in the wonderful make-believe

of the movies.



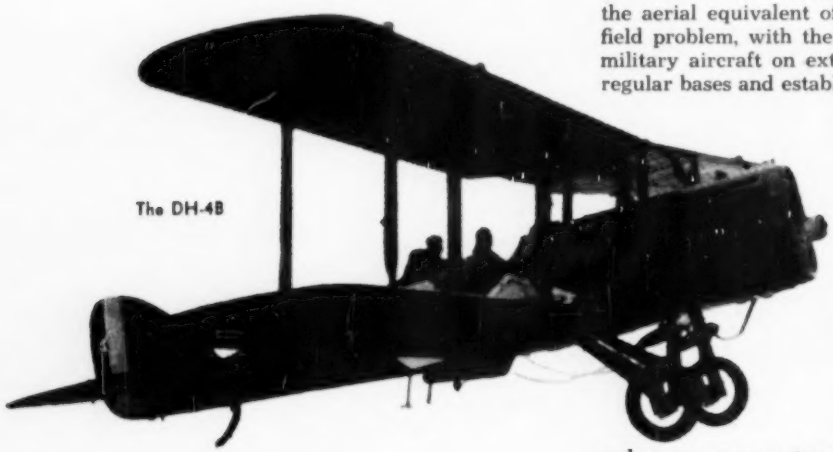
T-6 "Zero"

Burt Lancaster, a "rugged character," fires a 30 cal. air-cooled machine gun from the hip.

A Japanese "fighter," hit and streaming lamp black, makes ready to crash.

THE BIGGEST

The Army called it a "Reliability Test", but to press, public and pilots this was the granddaddy of all air races.



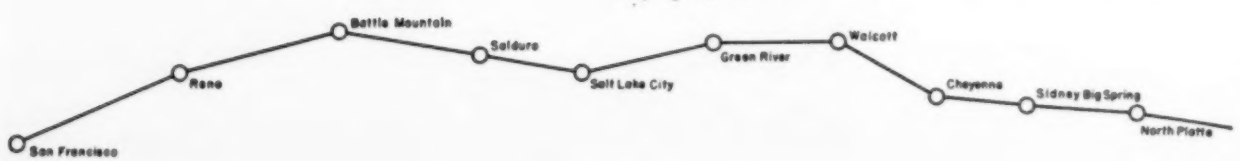
The DH-4B

By PETER M. BOWERS

IN THEORY, it was the "1919 Air Service Transcontinental Reliability and Endurance Test." In practice, it was the biggest air race the world has ever seen, before or since. There have been other races in which more planes were entered, and still others flown over longer distances, but none have produced the 340,326 plane-mile potential that existed when 63 of the original 74 entries taxied to the starting line on October 8, 1919.

As originally conceived, the project was the aerial equivalent of a standard Army Ground Forces field problem, with the object of testing various standard military aircraft on extended operations away from their regular bases and establishing a ground organization capable of servicing and maintaining the planes in the field. The actual task was to accomplish a coast-to-coast flight, with the option of making a round trip if the pilot and plane were equal to it. To give pilots in different areas equal opportunity to participate, the test was run in two divisions—one group starting from the west coast and the other from the east.

The spur of competition was added to invoke the atmosphere of urgency that would exist under wartime conditions. Since planes and crews were entered on an individual, rather than a squadron or flight basis, the competition aspect was rather unfortunate. Public and press caught "Race Fever," and in turn transmitted it to the pilots, who then flew to win rather than to prove the practicability of the overall military operation.



"Most of the fields were of the cow pasture variety." One of the planes participating in the transcontinental race is visible in the background, beyond the corn field.

AIR RACE

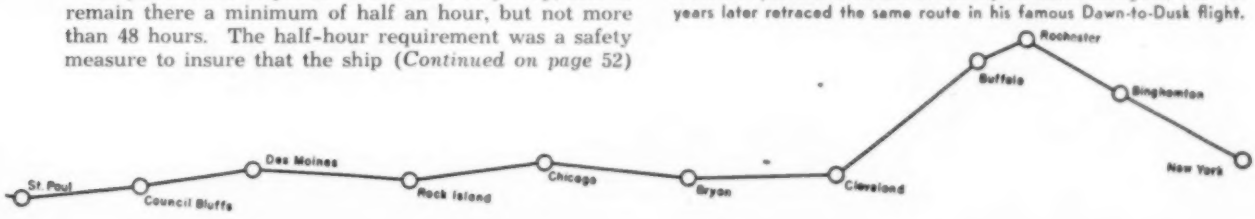
The race was open to any U. S. Army pilot recommended by his commanding officer, but the equipment used was limited to strictly standard military aircraft with a top speed of at least 100 mph. All flying was limited to the hours between dawn and sunset, although several pilots violated this rule by getting lost and landing after dark. Time on each airplane was computed from the time it left the ground until the wheels touched at the next landing. To prevent straight-in approaches to strange fields and scrambles for number one landing position, all pilots were required to circle the field once before landing. "Bounce" landings were permitted for record purposes, so a pilot was not penalized by lost time if he had to go around again after coming in hot or landing long on a high mountain field. Since the airplanes of that day were not equipped with brakes, this was a wise provision, as a deliberate ground loop was about the only way to keep the ship from going through the fence on an overrun landing.

The 2,701-mile route followed what was later to become the major portion of the transcontinental airmail route, connecting San Francisco with what is now Mitchel Field at Mineola, Long Island. Twenty intermediate landing fields were set up between these points, the greatest distance between fields being 169 miles. No airports existed at this time, and very few military fields, with the result that most of the intermediate fields were of the cow pasture variety, offering only the most basic necessities for aircraft operation. When the route had been decided upon, officers and men were assigned to each station, and were charged with the responsibility of setting up an operation there with facilities for refueling, repair, and spare parts.

All pilots were required to land at every stop, and to remain there a minimum of half an hour, but not more than 48 hours. The half-hour requirement was a safety measure to insure that the ship (*Continued on page* 52)

Lt. Gen. Hunter Liggett congratulates 1st Lt. B. W. Maynard, east-west winner of the race. Lt. Maynard was killed 3 years later at Rutland, Vt.

A French *Spad* was flown east to west by Lt. Russell Maughan, who five years later retraced the same route in his famous Dawn-to-Dusk flight.



Henry Burge, chief pilot on the Stephens faculty, instructs a student in the mechanics of pulling through a prop. Burge heads the school's program of flight instruction.

Pre-flight training for aviation majors at Stephens College includes Link Trainer practice.

Patricia Ann Sligh (right), one of Stephens' aviation enthusiasts, indicates the location of Columbia, Mo., on the map in the college hangar. It's in the heart of Missouri and near the center of the United States.

Stephens flight students show off trophies earned at an Intercollegiate Air Meet.

These girls from Missouri are out to show the rest of the world, with their

Readin', Writin' and RPM's

By PEGGY PHILLIPS

◀Barbara Erickson, flight instructor at Stephens and former student there, illustrates a flight maneuver.

The start of a happy ride! Scrupulous observance of safe flying practices at Stephens has resulted in 7,000,000 air miles flown without serious accident. ▼

◀A. D. Stedry, meteorologist with the U. S. Weather Bureau at Columbia, Mo., explains highs, lows and occluded fronts to a couple of Stephens students.

Gretel Sternberg checks the oil as she and Jean Ford, Stephens students, begin a cross-country trip. ▼

STUDENTS at Stephens College in Columbia, Mo., have flown the equivalent of 300 trips around the world, piloting the small planes which are as much a part of the regulation equipment at this junior college as science laboratories and textbooks.

Introduction of aviation to Stephens in 1941 attracted widespread attention. It was the first such course in the country, designed to train young women for positions in commercial aviation. Now it is a continuing and well established part of the curriculum.

Back in 1941 the immediate objective of the course was to train women to fill thousands of wartime jobs. As a result, Stephens graduates became ferry pilots, flight instructors, Link Trainer operators and held a variety of positions with the airlines. The program was considered of such importance that the nation's major airlines—12 at that time—helped get the program underway. Their friendly interest continues.

Today the purpose of aviation studies at Stephens is to develop attitudes based on the realities of the Air Age since students will be participants in a society using the airplane as a dominating force for world unity.

A sound general education is considered basic for all students taking specialized courses in any field and aviation students at Stephens are no exception. Representing 18 per cent of the total student (*Continued on page* 48)

Russia's secret bomber?

Fantastic is one word for the Saenger-Bredt. But is it impossible?

By JOHN W. R. TAYLOR

AMONG German aircraft designs and technical reports captured by the Allies in 1945 was a fantastic project for an intercontinental rocket-bomber designed to skim 12,000 miles through the upper atmosphere at a speed of 13,000 mph. British and American intelligence teams can hardly be blamed for showing more interest in the war-tested V.1 and V.2 and the still mysterious menace of V.3.

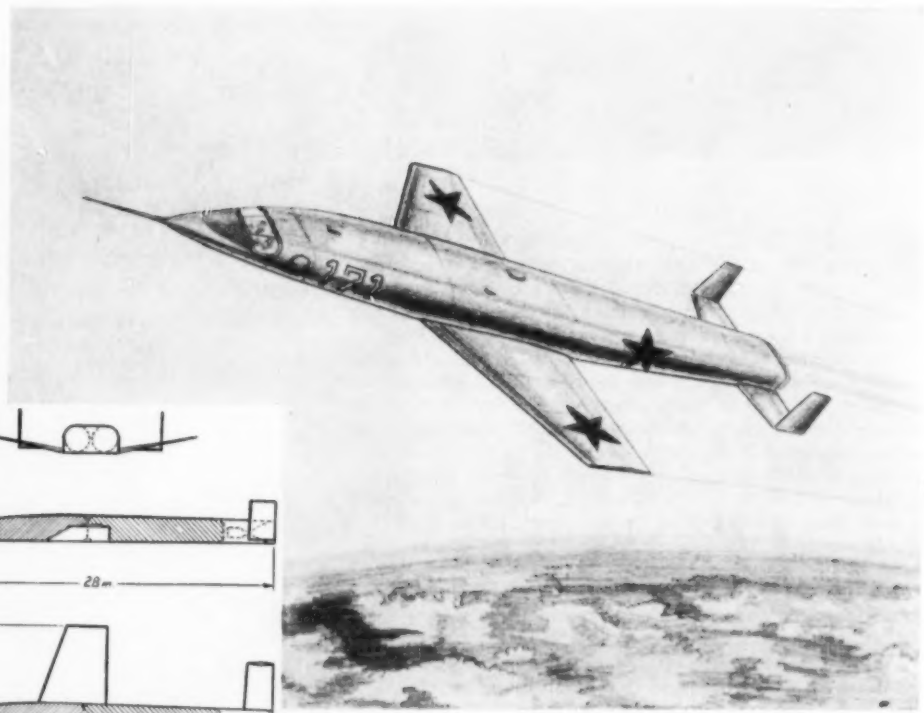
Even Russian technicians, eager to cash in on every scrap of enemy research, considered the Saenger-Bredt project little more than a complex mathematical study of no immediate use. Col. G. A. Tokaev, aviation expert of the Soviet Military Administration in Germany, dutifully wrote a report on it for his superiors, then forgot about it. In his book, "Stalin Means War," he emphasized how surprised he was to be summoned to the Kremlin a few weeks later for a conference with Stalin, to discuss the possibility of developing the Saenger-Bredt project into a bomber able to blast America with atom bombs from Russian bases.

Despite Stalin's obvious enthusiasm for the scheme, Tokaev claimed that he advised against trying to build the aircraft as envisaged by Saenger. Instead, he thought Saenger's report should be examined as a mere design study because "in science, it is just as important to discover what is impossible as to determine what is possible." If, in the course of doing so, the Russians succeeded in making a plane half as powerful as that foreseen by Saenger, Tokaev felt they would be doing remarkably well.

Nevertheless, Stalin insisted that all-out research be started at once and that Dr. Saenger himself must be "made to volunteer" to work on the project in Moscow. Saenger was not captured—he is living today in France—and Col. Tokaev escaped to the West in 1948. But he believes that Russian interest in the Saenger-Bredt may well result in some kind of rocket bomber. Persistent rumors from the other side of the Iron Curtain lend weight to this possibility.

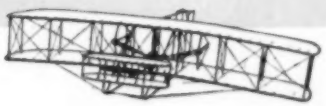
Wartime British intelligence officer, Asher Lee, is skeptical. In "The Soviet Air Force," he admits: "The feasibility of the Saenger project is . . . perhaps the most strategic rocket question today;" but adds that, in his opinion: "Despite gloomy predictions of two or three years ago, the Saenger design study will not be effective for some years." He believes the immediate danger is from Russian submarine-launched rockets, possibly with atomic warheads.

We must hope that Asher Lee is right, for this Saenger-Bredt, even in elementary, (*Continued on page* 61)



Below are designer drawings and at right the author's sketch of the 13,000 mph rocket-bomber envisioned by the Germans in 1945 and in which Russia is presumed to be actively interested. Flat undersurface of fuselage would permit aircraft to "skate" along upper atmosphere like stone on water.

Genealogy of American Aircraft



Rugged planes, with the accent on utility, are the cornerstone for the Fairchild fame.

By GILL ROBB WILSON

PRINCIPALLY known today as the prime producer of combat cargo "flying boxcar" transports, Fairchild is a name spread large across the history of American aviation. Scarce any line of aviation effort from aerial cameras to atomic engines that has not been identified with the name.

Designing the first of the Fairchild aircraft in 1925, the company, even at that time, had its eye on the object of utility. The original FC-1, for example, was created as a vehicle for Sherman Fairchild's aerial cameras. Fairchild espoused the idea that airplanes should be built to carry burdens and that idea has moulded the tradition of the company more than any other single factor.

Thus early, various Fairchild craft such as the FC-2, the FC-2W and the F-71 became notable on the more rugged frontiers of the air age . . . in the Canadian bush, in lifting cargo across the Andes, in developing mail service for Mexico, in forest fire fighting, and in originating the concept of military airlift.

It was an FC-2 with which Bell Telephone first began two-way radio development at old Hadley Field in 1928. It was an FC-2W2 that Admiral Byrd flew over the South Pole that same year. The F-71 was the principal transport on a dozen airlines in the early thirties.

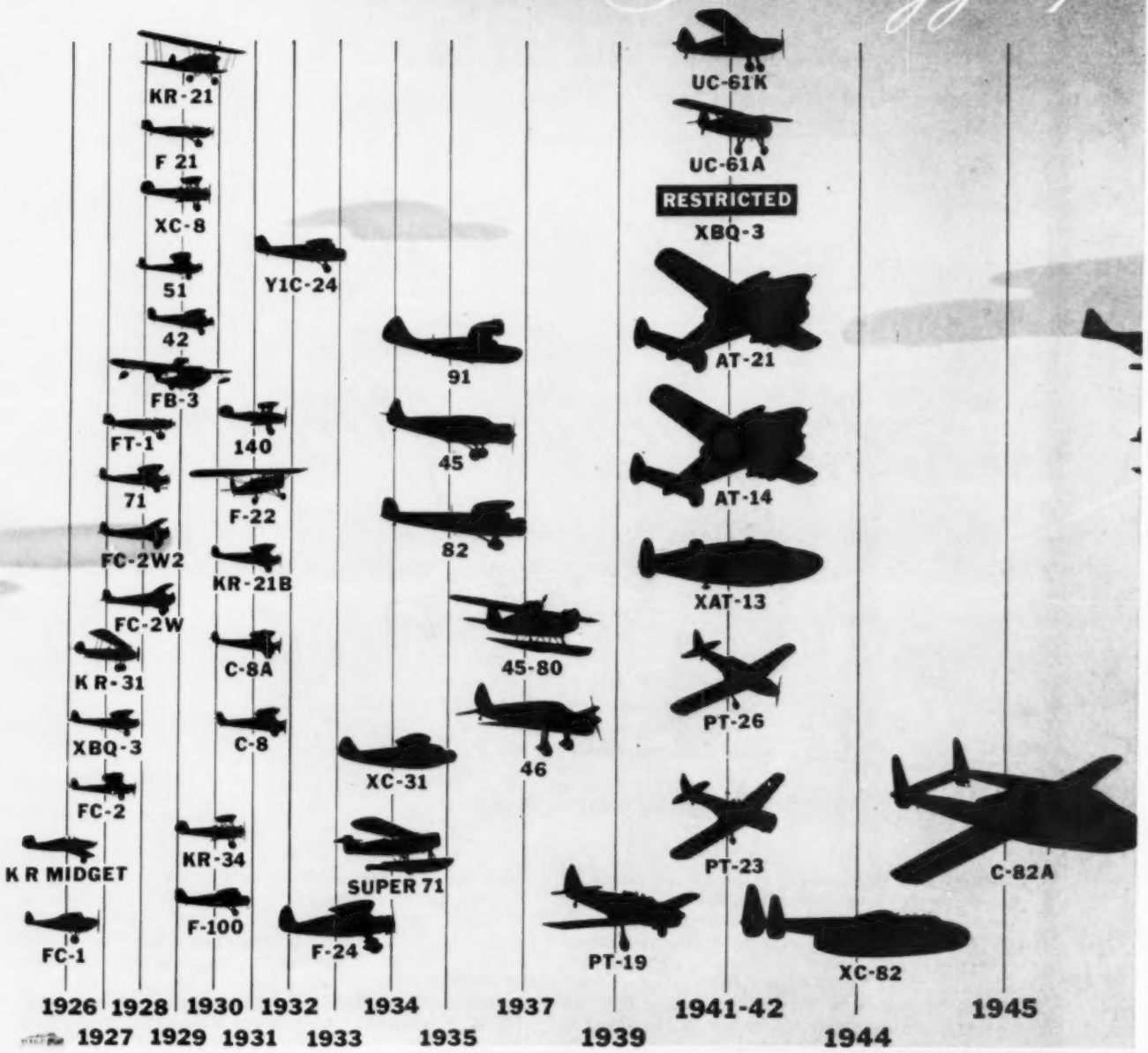
Over the years between the great wars a number of Fairchild models achieved exceptional popularity. The F-24 was an outstanding personal plane. The *Pilgrim* was a money-maker for the charter operators and executives of its day.

During World War II, Fairchild turned out some 8,000 PT-19, PT-23 and PT-26 primary trainers for the military services of the United States and Canada. A twin-engine gunnery crew trainer, the AT-21, was developed from the XAT-13 and AT-14, and a military light transport version of the F-24 was produced as the UC-61.

The original design of the C-82 *Packet* was begun in 1941, approved in 1942. First flight of the twin-engine cargo and troop transport with the twin-boom tail was in 1944. An improved version, the C-119, was first delivered to operational military units in 1949.

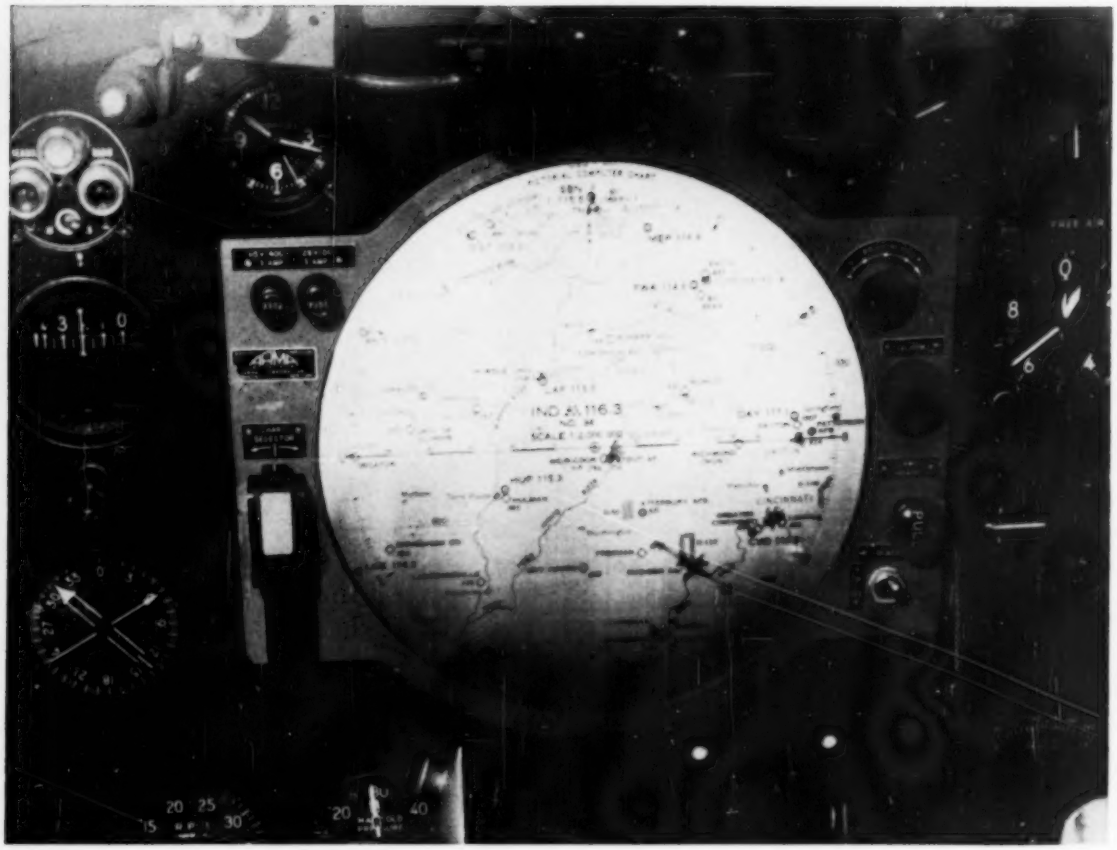
The C-31 of 1934 was the first aircraft designed primarily for military cargo, and from that time forward the Fairchild company has had a fixed destiny as an ultimate producer of combat cargo aircraft—the *Packet* family of "flying boxcars" now so firmly established in American aviation economy. END

Genealogy of



FAIRCHILD *Aircraft Division*

American Aircraft
C-119H
R4Q
F-11
C-119B
M-84
C-119A
C-119C
T-31
XC-120
1946
1947
1948
1950
1952
1953



1

Pictorial Computers

While the instruments grow more complex, the problem of air navigation grows simpler all the time.

By JAMES HOLAHAN

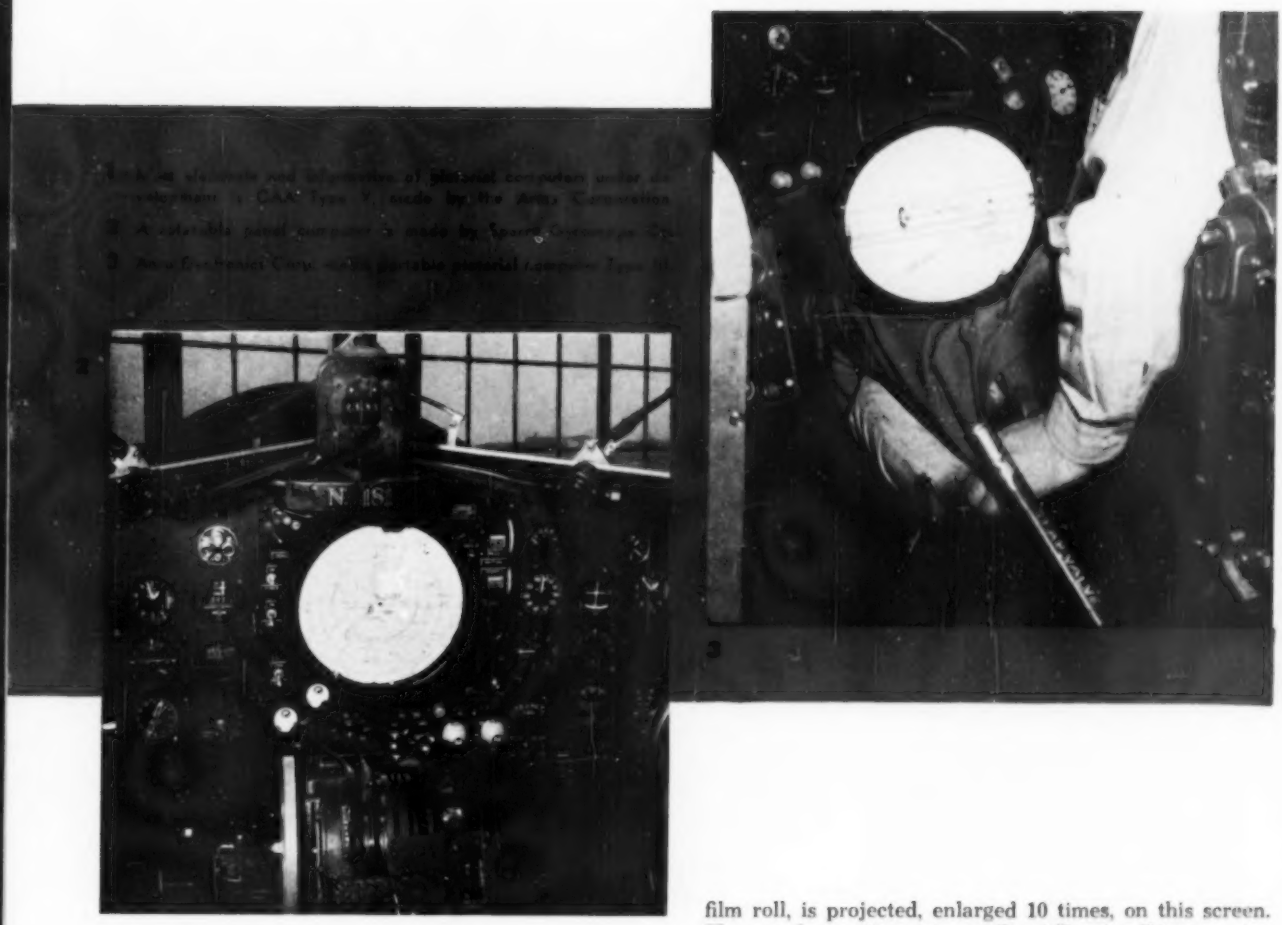
THE basic problem of air navigation is to establish one's position with reference to a known point or points. Various systems are used to solve the problem, with the end result always the same—the location of a point on a map or chart of the area over which the flight is being conducted. If the computation is correct, this point agrees with the actual position of the aircraft. Computing one's position, except in the case of dead reckoning by known landmarks, takes time. It also takes a certain amount of work and skill.

A foolproof system is constantly being sought, a system both simple and speedy. Frequently pilots who have flown the Link Trainer have suggested that a navigation device be designed similar to the little inked wheel which follows the apparent movement of the trainer. This wheel gives a continuous track of the movement of the Link. One glance tells you where you are with respect to where you want to go.

Through efforts of the Technical Development and Evaluation Center of the CAA, a similar device called a pictorial computer has come into being. Through TDEC, in conjunction with the Air Navigation Development Board, contracts for building three types of pictorial computers have been awarded to three outstanding electronic research and development companies.

A portable pictorial computer, labeled CAA Type III, is now being made by Aero Electronics Corp. Sperry Gyroscope Co. is working on CAA Type IV, a rotatable panel pictorial computer. The third model, CAA Type V, is a larger pictorial computer also designed for instrument panel mounting. It is the project of the Arma Corp., Brooklyn, N. Y.

All three devices are similar in that they are designed



for airborne use and furnish a continuous automatic record of the position of the aircraft on a map of the area over which the plane is being flown.

Information from the compass, the omnirange receiver and the distance measuring equipment in the aircraft furnish the necessary input signals which operate the equipment. These signals drive servomechanisms which cause a marker to follow the track of the aircraft on the area chart.

The three types of pictorial computers accomplish the same results. Of the three, Type V is the most elaborate and furnishes the most accurate information. It is with this type that this article will concern itself.

The Type V panel pictorial computer is being developed and built by the Arma Corp. They have been engaged for 34 years in the development of electro-mechanical devices for the Navy in the complicated gun fire control field. During the last five years they have branched out into airborne electronics. The panel pictorial computer is their first airborne navigational device. At present, six of the computers are in use and undergoing evaluation tests.

The panel pictorial computer is composed of two units: a display unit which is mounted in the instrument panel of the aircraft and an amplifier unit which fits into a standard communications rack.

The display unit contains a 10-inch diameter daylight type screen. A map of the area of flight, part of a 35 mm film roll, is projected, enlarged 10 times, on this screen. The map has as its center an Omni Bearing Distance station. All distances and directions are calculated by the computer with reference to this station.

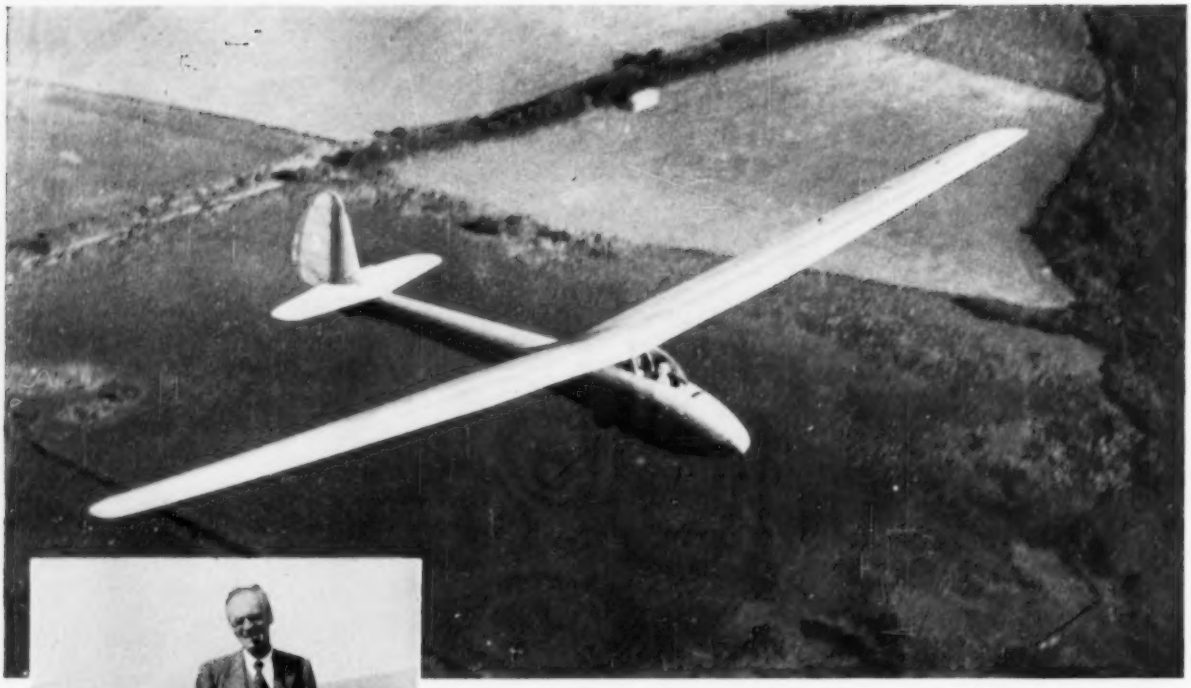
Position of the aircraft is shown by a miniature airplane, the "bug," on the projected image of the chart. The airplane figure is at the center of a series of concentric range circles. As the "bug" moves, the concentric circles move along with it so that it is always at their center. A long heading arrow pierces the symbolic airplane, running through the tail and out the nose. The "bug" is free to rotate as the heading of the actual aircraft changes. The range circles move around the chart with the "bug" but do not rotate with it.

Range from any place on the map can be determined by the range circles; heading is determined by the intersection of the arrow with the range circles which are marked in degrees similar to a compass rose. Heading may be read to within 1° in this manner.

The "bug" and range circles are projected on the screen by interposing two reticles between the light source and the screen. One reticle is in the shape of an airplane pierced by an arrow, the other in the form of concentric circles with radiating bearing lines.

The 35 mm film in the display unit is 100 ft. long and has an 800-chart capacity. Since there are only 291 OBD stations presently authorized and each chart must have an OBD station for its center, there is ample space on the roll for more than one scale of a map of any given area.

The amplifier unit is designed for rack mounting along with other remotely located communication and electronic gear in the aircraft. It contains relays, power supplies and amplifiers for the equipment. (*Continued on page* 58)



Above, a Slingsby *Sky*, high-performance sailplane, soars aloft. *At left*, Philip Wills, British pilot who won world gliding honors in Spain, stands at the nose of his *Sky*.

THE SLINGSBY SKY

A close-up of Britain's high-performance glider.

By J. C. REUSSNER

RECENT European gliding contests have given much publicity to a British sailplane, the Slingsby *Sky*. In its first appearance in an international contest, in Spain in 1952, seven *Sky's* which finished the contest placed first, third, fourth, seventh, ninth, eleventh and fourteenth. A total of 39 sailplanes were entered in that race, with the *Sky's* flown by British, Argentine and Dutch teams.

The *Sky* is a product of Slingsby Sailplanes, Ltd., a firm in the north of England which for the last 19 years has been given over to the design and construction of powerless aircraft. The prototype flew in 1950 and the type made its first public appearance in 1951 when the two *Sky's* entered for the event took first and second place in the British National Gliding Contests.

In appearance the *Sky* is a conventional sailplane of 18-metre span, but the manufacturers claim it marks the highest point yet reached in the design of a sailplane for quantity production. Wood is used throughout for the airframe construction, silver spruce for members and birch plywood for skins and covering. The rear parts of the wings and tail unit are fabric covered.

Estimates of the designers give the machine a best gliding angle of 1 in 29 for types fitted with permanent wheels and 1 in 30 for machines fitted with droppable undercarriages. Flight tests indicate that these figures may be on the low side.

Tests have been carried out in which a *Sky* has flown alongside a German Weihe sailplane so that a direct comparison of performance could be made. These tests demonstrated that at all speeds the *Sky* had a lower rate of sink, the difference being particularly marked at high speeds. This good gliding angle at high speeds—or penetration, as it is called—is one of the principal requirements of a modern high-performance sailplane, particularly if it is used for contest flying where points are

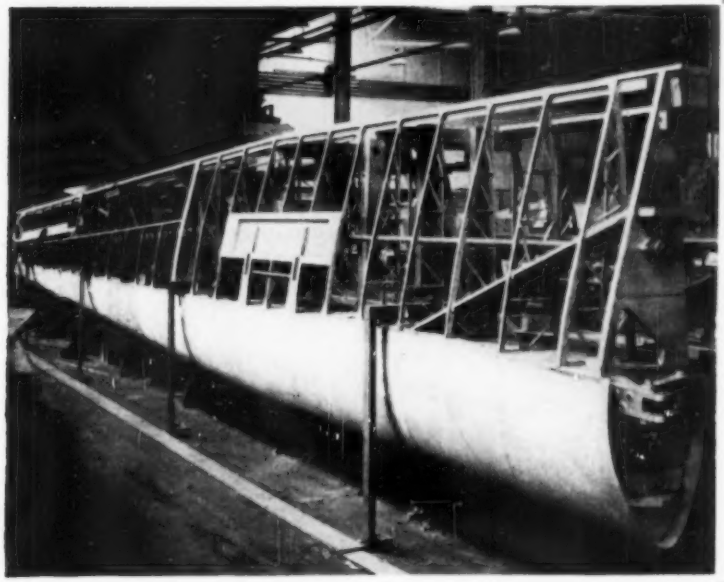
awarded average ground speed.

In addition to the more obvious advantage of increased performance, the *Sky* possesses other advantages less apparent. Not the least of these is its high strength. At an all-up weight of 800 pounds, the *Sky* is stressed for vertical accelerations of 8.3G and negative accelerations of 3.75G. The tare weight of the *Sky* complete with usual flying instruments is in the region of 550 pounds, which allows 250 pounds for pilot and extra equipment. *Sky's* flown by British and Argentine teams in Spain carried radio and oxygen apparatus in addition to the standard flying equipment and were still well under their permissible all-up weight.

Philip Wills, who took first place in the Spanish contests, attributed part of his success to the fact that the high strength of the *Sky* allowed him to fly through conditions he would have been forced to avoid in other types of machines. On the final day he was carried to a height of more than 23,000 feet in a thunder cloud which forced many other competitors to land. Although his *Sky* was subjected to heavy icing, it did not impair its handling.

In the same storm Jock Forbes, the second pilot in the British team, had to put his machine into a spin with the dive brakes out when his airspeed indicator iced up at 19,000 feet. He spun down through the center of the storm and pulled out at 10,000 without in any way damaging the machine. Forbes has stated that the excellent spin characteristics of the *Sky* can at times be a great advantage when the pilot has to get himself out of a difficult position.

F. N. Slingsby (right), designer of the *Sky*, discusses a problem which arose during flight tests with A. Pratt and T. A. Brown, respectively *Sky* test pilot and chief technician.



A *Sky* wing nears completion in an assembly jig. Sailplane structure is entirely of wood. Full wingspan incorporates use of 140 ribs.

The instrument panel in the *Sky's* cockpit. Blank space at right takes oxygen regulator.

The general handling characteristics of the *Sky* have been praised by many pilots. Controls are well harmonized and light. Ailerons, in particular, are effective and allow the machine to make tight turns in thermals. On several occasions the *Sky* has been seen to outclimb the Weihe because of its ability to make tighter turns in the same thermals.

Arrangement of the flying controls in the cockpit follows normal practice. The control column rises from a sleeve in the floor. Rudder pedals are hinged at the bottom and can be adjusted for position by the pilot while in flight, an arrangement which relieves the pilot of considerable fatigue on long flights by (*Continued on page* 39)

The Air Force radar operator (above), scanning his scope at an Air Defense Command Station, is ready to lend a hand to the private flyer groping through murky weather or faced with other emergencies.

The pros join

The military now runs interference for the airborne civilian in time of emergency.

AS "finger man" for the nation's jet interceptor squadrons, military radar has one primary assignment—to detect and pinpoint unidentified aircraft.

Now a secondary mission has been given to radar that can affect the safety of every private and commercial flyer. It is to assist in finding lost aircraft and to aid pilots in trouble aloft.

This mobilization of strictly military radar and active duty military units has never been formalized into a unified command activity by official Department of Defense order. Rather, the action has been an evolution, brought about by an excellent spirit of cooperation between the CAA and the Air Force, Navy, Army and Coast Guard with the blessings of their respective Washington headquarters.

Officers in charge realized that the demands of national security had resulted in the establishment of the greatest network of search, warning and control radar in military history. Part of this activity was a build-up of ground and air units. While all these were intended to play a key role in the defense picture, there seemed no reason why they couldn't serve private aviation at the same time.

As a result, procedures were set up whereby a pilot could get emergency help when he needed it. Today these cover virtually the entire nation and have given air safety an important boost. To survey a typical section of the country, this FLYING correspondent covered the area around the southern end of Lake Michigan. Here it was found that, without exception, every military and CAA facility was geared to aid the private pilot—GCA, ILS, PAR, ASR and all the others.

GCA crews at the Glenview, Ill., Naval Air Station;

GCA equipment at Glenview Naval Air Station includes a main control trailer, a power generator unit and a truck stocking spare parts.

the team

By NORMAN SKLAREWITZ

helicopters and tri-phibious planes of the Air Force's Air Rescue Service at Selfridge Field, Mich.; Coast Guard crash boats along the lake front and secret radar stations of the Air Defense Command—all have been briefed by the CAA to handle calls for assistance. While military fields are open to civilian aircraft only in the event of emergency, their ground personnel are nevertheless familiar with the problems and procedures of civilian pilots.

The exact way that a flyer lost over the lake or having mechanical trouble can be helped depends, obviously, on where he is and what he needs.

The CAA communications station at General Mitchell Field in Milwaukee, for example, has set up its unique Lakes Reporting Service. This system is the idea of H. T. Snow, the CAA's Communications Chief at the station. It involves a plan of coordinated action to follow accurately any aircraft making the hop across the lake.

LRS was established about three years ago. Here's how it works: A pilot planning a Lake Michigan crossing contacts the appropriate CAA radio station and requests the service. The station logs the pilot's position, route of flight and altitude. Then the pilot is given pertinent weather and wind data along with a reporting schedule. This schedule calls for a report back to the station every 10 minutes during the over-water portion of the trip.

The original station then teletypes the flight plan information to the station on the opposite side of the lake. Both stations then monitor the aircraft's radio frequency and log his check-in's. If a plane on LRS fails to make a report, the operator at the first station attempts to raise him by radio. If no contact can be established, the opposite station is queried by teletype in the hope that it has received word from the plane.

If no word has been received from the plane and there is reason to believe that it is in distress, a plan of emergency action is put into effect. This, in the words of Mr. Snow, involves calling in ". . . everyone but the local Girl Scout troop!"

In preparation for a GCA landing at Glenview, the alarm is sounded in the GCA ready room in the tower. Seconds later the crew truck rolls to a stop at a GCA truck site on the field and the men race to stations.

In quick succession, the following agencies are alerted: the Naval Air Station at Glenview where a PBY flying boat is available; the Milwaukee Coast Guard; local airlines (who in turn communicate with their aircraft in the vicinity); the Lorain County Radio Corporation radio station at Port Washington, Wisc., which makes communications with all Lake Michigan surface craft; the local air group of the Wisconsin National Guard, and all transient aircraft aloft in the vicinity.

At this writing, the LRS has been used by an average of almost 300 planes a month and it has a 100 per cent safety record. For it, Mr. Snow gives credit to the "unqualified cooperation" of all groups concerned and his staff of CAA Airways Operations Specialists. These include J. A. Flor, R. P. Achatz, P. M. Leschig, L. K. Abbadusky and D. A. Russell. (*Continued on page* 45)

Famous speed pilot, Joe De Bona, presents a trophy to first-place winners in the TAR: Frances Bera, pilot (center), and Marcella Duke, co-pilot. Mrs. Bera, 28, has been a flight instructor for eight years, has logged 4,500 hours and parachuted 10 times.

Weather all the way

A contestant reviews the highlights of the 7th All-Woman Transcontinental Air Race.

By BEATRICE EDGERLY

(Editor's note — Beatrice Edgerly of Tucson, Ariz., painter, illustrator and writer, competed in the Seventh Annual TAR as co-pilot in the Bellanca piloted by Gerry Mickelsen, newly elected President of the Ninety-Nines.)

FORTY-NINE lightplanes winging across the Continent! Ninety-seven women making up the pilot-co-pilot teams for the small ships in the 2,700-mile race! This was the 1953 version of the All Woman Transcontinental Air Race—the TAR—which has won for itself a spot among the nation's sporting classics.

This was a good, stiff contest, to try the capabilities of planes and pilots. It was also a good show for those on the sidelines, as the colorful little ships popped down out of the sky for gas, then took off speedily on the next leg of the long journey.

High speed, endurance, power—these factors did not enter the picture. Rules called for stock models only, and these under 300 hp. To the participant, three aspects of the TAR stood out. First, there was the superlative sportsmanship. Then there was the efficient handling of the problems—of the ship and the course and the weather. Third, but by no means least, there was the sheer love of flying, for the fun of it.

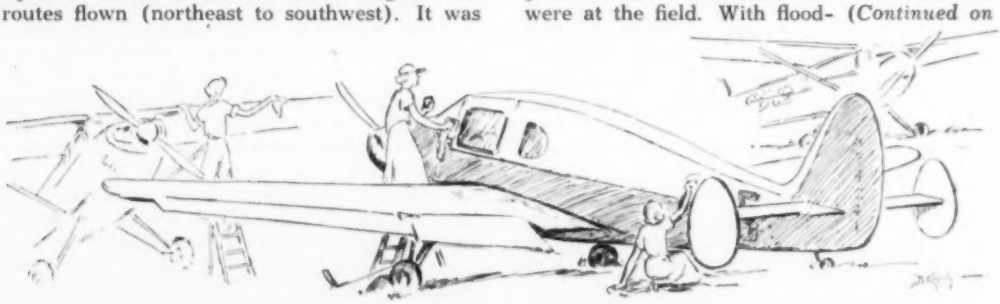
This year's Seventh Annual TAR was the first east-west race attempted in the series and one of the longest coast to coast routes flown (northeast to southwest). It was sanctioned by the Ninety-Nines, national organization of women fliers, and by the National Aeronautic Association.

Despite the long and intensive preparations for the race, problems arose quite suddenly at the starting point, Lawrence, Mass. These problems, in the form of winds and weather, were quite beyond the control of all committees, friends and city fathers.

Beautiful weather attended the impounding deadline when the ships were due to arrive in Lawrence, and for two clear, sunny days the 49 planes stood companionably, wingtip to wingtip, nose facing nose, along the grass strips of the new Richard E. Condon airport. Inspection by CAA officials went on and the ships were washed down and waxed lovingly by their crews until they shone in the sunlight.

Following the afternoon of pre-race briefing, and the airport dedication ceremonies, the sun set with a fresh breeze. Pilots returned to quarters to await an early call for pre-flight briefing and take-off.

At midnight the alarm went out. The cold front, known to be due in the area within 12 hours, came in early. Preceding it was the storm—a young tornado, as it seemed. The town turned out magnificently. Within 20 minutes, police cars, civil defense and Civil Air Patrol units were at the field. With flood- (*Continued on page 57*)



The annals of aviation feature some breath-taking

tales of pilots suffering from **Oxygen Lack**

By MICHAEL DENVER

QUEER things happen when you don't get enough oxygen. That's not likely to worry the man in the street—unless he flies pretty high in an airplane that isn't pressurized, or decides to climb Mount Everest. But in the RAF the chaps who fly are quite concerned over the effects of oxygen lack. "Anoxia"—that's what the M.O.'s call it.

It's rather like being a little tight, in the early stages. You become exhilarated, giggly and over-confident; at the same time your judgment becomes unreliable, you become somewhat irresponsible and you may even have hallucinations.

All this is quite amusing to talk about on *terra firma*, but it's not nearly so funny when you're one of the crew of a bomber and the pilot is suffering from anoxia. Imagine yourself as passenger in a car doing 75 or so on an icy road with a drunken driver, and you'll see what I mean.

There are all sorts of odd stories about oxygen-starved pilots. There was the pilot who put his wheels and flaps down and tried to land on the clouds, at 15,000 feet over enemy territory and with all his lights on. There was the chap who came back from a night "op" in a heavy bomber and beat up his home aerodrome as if he were flying a fighter, despite the fact that one of his engines was out of action and his flying controls were full of flak. And there are plenty of stories about some member of a bomber crew clouting the pilot with something heavy to knock him out for a few seconds while someone connected his oxygen pipe.

You see, when a man is suffering from oxygen lack it's no use trying to tell him so, because he just won't believe you.

During the war, the RAF had rather a neat way of impressing crews with the necessity of seeing that their pilots had enough oxygen. They first put the whole crew into a decompression chamber. This was simply a steel tank, like a boiler, with some observation windows in it. When the crew was comfortable, they clamped the door shut and proceeded to suck out most of the air with a pump. The effect on the inmates was the same as a climb to high altitude. What made it impressive, however, was that all the crew wore oxygen masks *except the pilot*.

As the "altitude" increased, the effect on the pilot became more and more noticeable. At 5,000 feet the effect was negligible. At 10,000, a mild facetiousness became apparent. At 15,000, if he were playing cards with the crew, the odd mistake crept in. At 20,000, his game became absurd, he couldn't do simple addition and subtraction and his speech slurred. Not long after that he would collapse, unconscious, in the middle of trying to write his name in a scarcely decipherable scrawl. A few moments after his mask was put on and connected to the oxygen supply, he would be his normal self.

The author, a flight instructor and combat pilot in World War II, is now test pilot for a British aircraft company. He's flown 3,000 hours in singles, multi's, jets, turbo-props.

After a demonstration like that, crews were usually convinced that the skipper's oxygen supply was not unimportant.

Which reminds me of Johnny.

Johnny was a Canadian. He was also my bomb-aimer and a darn good man to have in a crew.

One night in 1944 we were coming home from an attack on Brunswick. It was quite a long trip home, and not devoid of interest. There was a lot of Hun fighter activity, a lot of searchlights, a lot of flares, and quite a bit of heavy flak. Bill, my navigator, seemed to be pretty hard at work, too. At any rate, he gave me a lot of changes of course—so much so that I pulled his leg and told him he'd better go on a refresher course if he couldn't make up his mind what to steer and stick to it for at least a couple of minutes.

About 90 minutes after leaving the target, Johnny called me up on the inter-com and said his hands were cold and he couldn't get them warm. He was afraid of frostbite, he said. I told him to light a small fire in the bomb bay and warm himself up. He said he wasn't kidding, he was cold, and would I please turn up the oxygen a bit to (*Continued on page* 60)

DUST IS

◀ Entomologist Lloyd Ford makes periodic "sweeps" of each client's fields. He traps insects in his net, then counts and classifies various types.

One of Jim Vedder's jobs is plane maintenance. ▶

Pilot Jim Vedder (right) and Entomologist Lloyd Ford whose partnership teams science and aviation. ▼

THE AIR AGE AT WORK

NO. 6

This is the sixth in a continuing series illustrating aircraft at work.

By JAMES JOSEPH

THEIR DESTINY

LAST YEAR and the year before little one-lungers churned over the broad expanse of U. S. farmland, laying down more dust, spray, fertilizer—and doing more seeding—than ever before. The year 1951—the last year of full record—was agricultural aviation's biggest bonanza. During its 12 months, agi-vators were at the controls 685,000 hours, 52 per cent more than the 450,000 logged in 1949. Significantly, this steep climb came at a time when general flying, outside the scope of the airlines, was in a downward glide.

How had the agi-vator become the chore boy of American farms and ranches?

"Pilots are getting smarter," a rancher of my acquaintance declared. "They're teaming up with science."

He could remember when any guy with a bi-winged hedgehopper and a steady nerve could hang out a "Crop Duster" shingle and set himself up in the business of dodging fences.

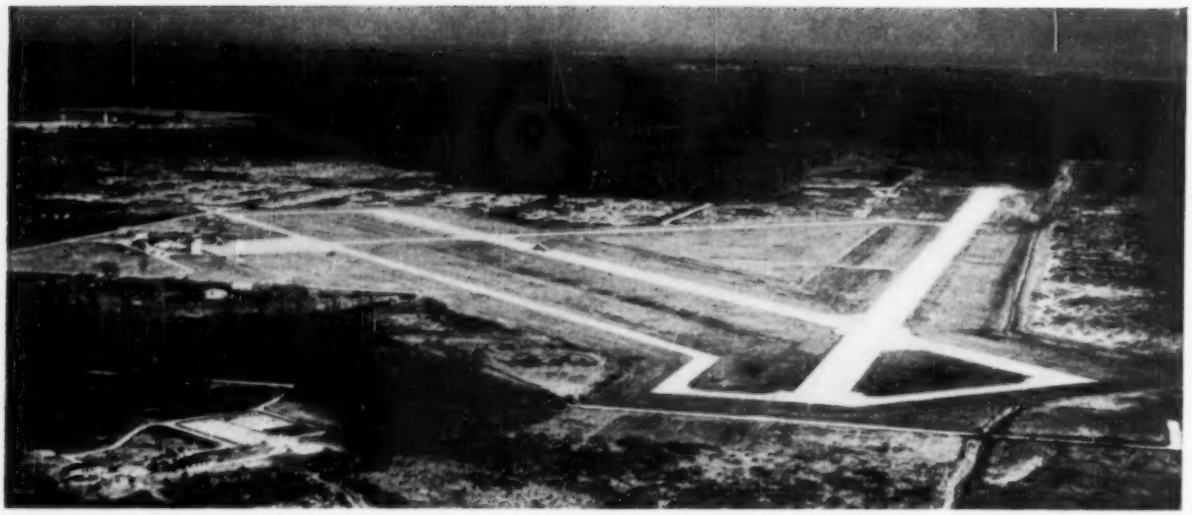
In those days, a pilot could pick up $50 to $100 an hour and not know enough entomology to tell a boll weevil from a desert gnat.

A duster can't get by with that sort of ignorance any more.

Who says he can't? Well, the ag-school graduate who's cultivating a lot of today's acreage says so. So say the County Farm Advisers—the gentlemen who often decide who is an "approved" duster and who is not. Then there are the guys who really make it tough on the crop duster—the chemists.

Science began overtaking the duster-pilot right after World War II. First it was DDT—what it could and couldn't do in the way of prodding unwanted insects out of vegetable fields. Then agricultural chemists, out to advance American farm output, got fancier and fancier. The names of their insecticides, (*Continued on page* 65)

At left, sprays are mixed in a huge portable tank and later transferred to one of 5 sturdy Stearmans (below).



Patrick Henry Airport, at Warwick on Virginia's Lower Peninsula, welcomes airborne visitors to Colonial Williamsburg. Runways are 3,500 and 5,000'.

Patrick Henry Airport

A modern airfield provides a 20th Century gateway to an 18th Century town.

By WILLIAM W. NEALE

THE private airplane owner may be able to do better than 100 miles in one hour in the air, but from one point in Virginia he can also travel some 200 years in 20 minutes on the ground.

Fourteen miles along a four-lane highway from Patrick Henry Airport, on Virginia's Lower Peninsula, lies the historic city of Williamsburg. There buildings, gardens, streets, handicrafts, taverns and even the atmosphere itself have been restored to what they were in the 18th Century. By plane, train, auto, bus, boat and private yacht some half a million people flock each year to see the town where Patrick Henry cried out against the Stamp Act, where George Washington was schooled in politics, and where Thomas Jefferson endured the pangs of unrequited love.

Each year several hundred of these visitors arrive by private plane, usually landing at Patrick Henry, the nearest airport to Williamsburg now in operation. An airport limousine service, on 24-hour call, takes passengers two centuries back along Route 168 to Williamsburg for $1.73 per person. Seven-passenger limousines are available at $5 an hour for a tour of the entire historic area, including Jamestown and Yorktown. The airport is also arranging for drive-yourself service which will make cars available for $5 a day plus 9c a mile.

While pilots and passengers are soaking up history, Patrick Henry officials provide all the standard airport services—refueling, minor repairs, major maintenance and even a janitor who will clean the plane. A direct line to the Norfolk control tower provides for the exchange of weather in- (*Continued on page* 50)

Carlton Putnam, Board Chairman of Chicago and Southern Airlines, Mrs. Putnam and Wallace Myers of Charles Scribner's Sons tour Williamsburg in a 200-year-old carriage with John Sheppard as guide. The group flew into Patrick Henry Airport from Washington for a day's tour.

No. 165

I learned about flying from that!

Unless you're spoiling for trouble, a thunderstorm rates a wide berth.

By WILLIAM R. FUCHS
Major, United States Air Force

THE heart of old man thunderstorm has always held my careful respect, but it took a special occurrence to teach me equal respect for his whiskers.

I was instructing in B-24's, flying out of what was then Tarrant Field, now Carswell Air Force Base, at Fort Worth. We were off airways and my student-officer was flying partial panel instruments with artificial horizon and D/G covered—doing a pretty good job of it, too, in smooth air.

Off in the west a front was moving in with a very definite line squall lurking near the horizon. Thinking to give my student a little rough air experience I handed him a heading which would approach the storm. I had no intention of flying into it. Just a brush along the edge to pick up some turbulence would be enough for my purpose.

Nosing along on the heading I had given him, the student picked up turbulence as scheduled. A boost on one wing; the student recovered. A drop of the nose; again he recovered. Suddenly we were in rain—not a gentle drizzle, but an honest-to-goodness downpour—and there was no need for an instrument hood, for we were in the soup.

Good experience, I thought, glancing at the student. We'd skirt along the storm a little more, then head for home.

Then it came—BANG! An explosion. It seemed to come from the interior of the airplane. As we stiffened to alertness there was another bang, followed by a series of explosive noises. I turned my head to shout a question to the crew chief standing beside me. That action probably saved my eyesight, for the next instant the heavy windshield on my side came crashing in upon me, cutting my neck and face. There was no need to question the crew chief. We knew the answer—hail. It sounded as though someone was hitting the fuselage with baseball bats.

Tearing off the covers hiding the artificial horizon and D/G, I yelled to the student a heading that would take us away from the storm area. In a minute we were out of it. The crew chief handed me a souvenir—a chip, an inch and a half in diameter, from the hailstone that had broken my windshield. A terrific blast of air whistled in through the hole where the windshield should have been, and my face was numb. Back to the base we limped.

An inspection after landing showed that the rugged old aircraft had come out second best in the encounter. All the glass in the plane except the left front windshield and the side windows was broken or cracked. The bombardier's nose and the top turret were wrecked. Engine cowlings were badly battered. There was a hole in the horizontal stabilizer big enough to plunge a fist through.

One reads a great deal about how to fly through a thunderstorm, and about the weather squadrons who fly through anything. With all proper respect for those who fly through thunderstorms, I give them a wide berth.

At no time did we fly into the storm. We never got beyond the edge of it but we learned that the edge of one storm can be as rugged as the center of another.

One look at the battered B-24, with its far-from-flimsy construction, gave me a good idea of what would have happened if I'd hit the area in my own lightplane.

I have sometimes seen hail show up as a green haze on the edge of a storm but there was no green haze that day, so the absence of this phenomenon does not necessarily mean the absence of hail.

That experience taught me a lesson I've never forgotten. It's not only the middle of a thunderstorm that's to be avoided; the edge may be just as bad. END

WING TALK

WORKSHOP DRAWS 150 TEACHERS

One hundred fifty high school and junior college teachers from nearly every state and the territories gathered at the University of Colorado, Boulder, Colo., during July and August for the second annual National Aviation Education Workshop sponsored jointly by the University of Colorado and the Civil Air Patrol, civilian auxiliary of the U. S. Air Force.

Gill Robb Wilson, editor of FLYING Magazine, was the key-note speaker for the five-week program of study sessions, field trips and special projects. The 1953 edition of the workshop was dedicated to the 50th anniversary of the Wright Brothers' epoch-making flight over the sands of Kitty Hawk.

More than half the teachers attending did so under scholarships given by CAP units or individuals and organizations interested in the advancement of aviation. The largest single delegation of teachers came from the Territory of Hawaii.

The 1953 workshop was directed by Dr. Mervin K. Strickler, aviation educationist with CAP's national headquarters in Washington. Among the more than a score of top educators who participated in the workshop either as members of the faculty or as guest lecturers were Dr. Roland H. Spaulding, professor in charge of Aeronautical Education at New York University, and Ray Mertes, director of School and College Service, United Airlines.

Instructors were drawn from the ranks of prominent educators, qualified CAP members and Air Force officers who are professors of Air Science and Tactics for the Air Force ROTC programs in several colleges and universities.

From among the outstanding teachers who attended the 1952 workshop 13 were selected to be group discussion leaders at the 1953 sessions and were given scholarships by Civil Air Patrol.

CAP and university officials described the 1953 workshop as "extremely successful."

CIRCLES GLOBE IN 99 HOURS

A new record for round-the-world flight by commercial airlines has been established by Horace C. Boren, PIO for the Texas Wing of CAP and public relations director for Braniff Airways Dallas, Tex., office.

Boren circumnavigated the globe in 99 hours, 16 minutes. His flight broke the old record of 119 hours, 47 minutes set in 1949 by Maj. Thomas G. Lanphier of Washington.

His trip took him from New York to London in a conventional aircraft, from London to Tokyo by *Comet* jetliner and from Tokyo to New York again by conventional transport plane. He also added to his record by returning to Dallas before 177 hours had elapsed.

Boren made the flight in observance of the 50th Anniversary of Powered Flight, the 25th birthday of Braniff Airways and the 12th anniversary of CAP.

RESCUES AND MORE RESCUES

From three widely separated parts of the U. S. and its territories come three stories of rescue by Civil Air Patrol pilots.

In Rochester, N. Y., sunburned, hungry and voicing his praise of CAP, Dr. Kenneth W. Moore stepped ashore from a cabin cruiser that had picked him up after he had spent nine hours adrift in an open boat lashed by 17-foot waves on Lake Ontario. The 58-year-old dentist was none the worse for his long hours in the 12-foot plywood boat.

Dr. Moore was found by CAP pilot Earl Siegfried and his observer, Joseph Keable, Jr., who were manning one of the five planes which risked high winds to search for him. Dr. Moore was on a mercy mission himself when he became stranded in his aluminum skiff. He was en route to bring in Wyatt Raleigh whose outboard motor failed leaving him at the mercy of the waves a mile and a half off shore.

Dr. Moore's boat was swamped as he tried to lash it to Raleigh's craft. Raleigh ended up swimming to shore while the doctor's boat was blown out into the angry lake.

The search plane had to refuel and return to its vigil over the doctor's boat three times before the cabin cruiser could reach it.

In Alaska, Maj. Dick McIntyre and Lt. Bob Hunter found a downed helicopter shortly after it was reported overdue. The rotary-wing craft had exhausted its fuel and made an emergency landing. McIntyre landed on a nearby lake and gave the helicopter pilot enough fuel to reach a nearby airstrip. Eight planes flew 32 hours before the helicopter was found.

Near Holbrook, Ariz., a motorist went over a steep embankment on a lonely road, then wandered for three days in a dazed condition before he was found by members of the Holbrook CAP Squadron. Planes and ground parties participated in the search.

GIRL CADETS GET HAWAIIAN TRIP

The outstanding girl cadet from each of CAP's eight regions spent two sunkissed weeks in Hawaii this summer as a reward for their exemplary conduct and performance. The Hawaiian trip is a new addition to the CAP slate of summer activities designed as the feminine counterpart of the International Cadet Exchange and is expected to serve as a valuable incentive to girl cadets.

Selected for the honor this year were Louise M. Greene of New York City—Northeastern Region; Shirley Ann Crosgrove of Jacksonville, Fla.,—Southeastern Region; Roberta Ann Abdonn of Indianapolis—Great Lakes Region; Joan Marie Rumph of Waterloo, Iowa—North Central Region; Lynn Briggs of Anchorage, Alaska—Western Region; Sarah Carpenter of Farmington, N. M.—Southwestern Region; and Ann A. Nye of Twin Falls, Idaho—Rocky Mountain Region.

Escort officers for the girls were Lt. Col. Alice Hammond of the Michigan Wing, CAP, and Maj. June Everett, USAF, of CAP national headquarters.

One of the outstanding events of the Civil Air Patrol summer calendar was an all-girl cadet encampment at Lackland Air Force Base, Texas, attended by 49 cadets. Here a group of cadets are introduced to a piston-engine fighter—the F-47 Republic *Thunderbolt*, one of the first-line fighters of World War II still flown in numbers by the Air National Guard. Familiarization with Air Force aircraft also included the latest types of jet fighters.

Slingsby Sky

(Continued from page 29)

allowing him to alter his sitting position.

The knob for releasing the towing cables is positioned under the left side of the instrument panel; a pull on the knob operates both front and rear releases. The releases themselves are of a pattern which automatically drops the cable if it reaches an angle dangerous to the aircraft.

The dive-brake operating lever is positioned on the left side of the cockpit and the elevator trimmer control in a complementary position on the right side.

The structure of the *Sky* is entirely of wood and in general follows normal sailplane practice. The fuselage is of semi-monocoque construction and consists of light frames interspaced with stiffeners, the whole covered by a plywood skin. The cockpit part of the fuselage is a double skin shell. This gives clean lines both inside and out and provides good heat insulation for the pilot.

The wing structure is made up of a main spar and torsion carrying nose box. The rear part of the wing consists of light ribs and, outboard, a light spar to carry the aileron. Due to the thin section of the wing the main spars are of massive construction and themselves account for 25 per cent of the structure weight of the aircraft. The nose box is stiffened by ribs placed at four and one-half inch intervals, 140 ribs being used in the full span of the wing.

Flexible Wings

The ailerons, 16 feet long, are divided into two separately controlled sections. This arrangement prevents the aileron control stiffening up when the wing flexes under load. Wings of this type may reflect as much as three feet at the tip when subjected to rough air gusts.

Dive brakes are located behind the main spars at a point nine feet out from the fuselage. They are of an aerodynamically balanced type: movement of the bottom brake which opens with the airflow assists the top brake which opens against the airflow.

An interesting *Sky* feature is the way in which the structure has been designed to provide maximum storage space. The main bulkheads aft of the cockpit are so arranged that they give access to a large part of the rear fuselage when the parachute box in the cockpit is removed. This arrangement not only allows the space available to be used for stowage but also means the controls in the forward fuselage can be serviced from inside, thus obviating the need for access panels in the skin.

The radio installation was designed by Pye Radio, who adapted one of their standard walkie-talkie sets for the job. The transmitter-receiver is positioned behind the cockpit and remote controls are run forward to the pilot. Power is obtained from dry batteries enclosed in the sets. These are sufficient to provide 10 hours of continuous operation. The whole installation weighs eight pounds and when used in conjunction with a 15-watt ground set has a range of between 40 and 80 miles depending on conditions.

Rugged Radio

The British team in the Internationals in Spain attributed a large part of their success to the radio. All retrieving cars were fitted with sets and in many cases the ground crews, acting on instructions given by the pilots, were able to be on the spot within minutes of the sailplanes' landing. Radio also allowed the pilots to give each other advice in the air. One observer listening in on a ground set said that at times it sounded more like a committee meeting than a gliding contest. Some idea of the reliability of the sets is shown by the fact that when Frank Foster crashed his machine on the first day of the contest his radio still worked although his aircraft was a complete write-off.

The standard oxygen system installed in the *Sky* is intended to give four hours supply at 30,000 feet. The layout consists of a pressure bottle located in the center section of the fuselage connected by a high pressure pipe to a regulator on the instrument panel. The regulator contains a flow and contents gauge and an emergency by-pass valve. A low pressure pipe from the regulator is taken to a plug-in point on the cockpit side. The face mask is of light plastic construction and incorporates an economizer bladder.

The manufacturers are now putting the *Sky* into quantity production and there are indications that it will become the standard high performance sailplane in several countries. END

Success of the Wing Ding to Canada was credited to the planning committee from Worcester's NAA Chapter. Members shown here include: (front row) Don Webster, Robert Stockhaus, James W. Adams and Richard P. Griffin; (back row) Bob S. Franks, Robert W. Mercer, Sheldon V. Coleman and Ernest L. Olrich, Jr.

DESTINATION ST. JOVITE

"Neither snow nor rain nor heat . . . stays these couriers . . ." so goes the postman's creed. Worcester (Mass.) NAA chapter deserves a similiar quote, for neither rain nor tornado destroyed the Wing Ding to St. Jovite, P. Q., Canada early this summer.

With an active chapter of 110 members and a loyal, determined pair of chairmen in Bob Stockhaus and Bill Olrich, Worcester's Wing Ding successfully filled "Gray Rocks Inn" with fun-loving pilots who expected and got the time of their lives.

By popular demand, Worcester's planners have returned to St. Jovite three times. The International touch is liked and, by clever handling, customs and immigration problems were cut to a minimum. One stop was made . . . in Burlington, Vt., and all the red tape was over. The weekend consisted of cocktail parties, swimming, island parties, steak barbecues, boating, horseback riding and sightseeing all jammed into two delightful days and nights.

Efficiency races, spot landing contests, and over $500 in prizes added to the week-end. Reuben Redfield of New Jersey proved to be the top-notch calculator by winning the $200 Longines Chronograph for the efficiency race and a rod and reel for the spot landing contest. Donald Webster, National Aeronautics Association's General Manager, was awarded the magnificent "Dr. Witt Memorial Trophy," given to the individual who, in the opinion of the NAA, has done the most for private aviation in the past year.

All in all, the national organization of NAA can be proud of their Worcester Chapter for planning, promoting and carrying through the popular Wing Ding. Safety, efficiency and pleasure are keynoted in this annual affair . . . there should be more like it.

—Page Shamburger

FLYING FARMERS

By BILL RENSHAW

THE PAYING PROPOSITION

Are Flying Farmers wed to their airplanes, "through thick and thin and for better or worse?"

The answer is probably "no." That "no" doesn't come because farmers don't like to fly—they love it.

It comes because only a comparatively few farmers can afford an airplane as a luxury. Let farm prices toboggan and a lot of farm-based airplanes will find their way to the auction block.

Should that unhappy day come there will be much wailing and shedding of tears.

To ward off such a day, Flying Farmers of all kinds (except the very largest) are groping for new uses for their airplanes. To find out how farmers far and near use their planes in their business, this columnist has just contacted Flying Farmers big and little in every section of the nation. First question asked was "Does your airplane pay its way on your farm?" Five out of six said "no."

Of those who said "yes" Ralph Farley of Princeton, Ill., is typical. Farley buys and feeds lots of beef cattle. He maintains that his airplane puts him close to the better feeder markets, thereby paying for "its keep."

Most of those who say that their airplanes do not pay their way from a strictly business standpoint point to very important non-business uses. John Gehman of Barto, Pa., for instance, makes a good case for the farm airplane after saying that his pays for one-fourth of its keep.

"Our airplane brings us better living, so you couldn't take it away from me, my wife or our three children," Gehman concludes.

Asked how large a farmer has to be to justify owning a plane, Gehman points out that number of acres farmed, cows milked or hogs fed isn't necessarily the determining factor. "We drive a second hand car," he writes, and adds: "We save it as much as possible by using one of our two farm trucks." This sacrifice, he explains, makes a plane possible.

This story of sacrificing something so they can afford a plane runs like a thread through most of the letters. It is rather positive proof that farmers, once they are bitten by the aviation bug, never get over it.

Fred S. Disosway of Sheldon, Ill., figures that a farmer with a profitable dairyherd need only add two good cows to his herd if he is willing to start off with a good used tandem type plane. Those two extra milkers will, Fred estimates, do the job, and they'll get a fellow started off in the kind of plane a new pilot can handle.

Many folks hold that the words Recreation and Relaxation should be used more in writing and talking about airplanes. In a world tense with fear and uncertainty more and more recreation is needed, prompting Flying Farmers to ask "Where can one find a more relaxing hobby than flying?"

Barrister Straley Thorpe, counsel for mid-western FF's, puts the recreational features of flying in sharp focus. "You can't work like a dog all the time without feeling like a dog," Straley says, adding "An airplane pays off in exactly the same manner that fishing, golf and other diversionary pleasures pay off."

Regardless of what you ask Flying Farmers about their airplanes, they eventually get around to that big word utility. Closely tied to utility is "places to go." Many mid-western farmers, half sold on flying, rode to Pensacola with their FF neighbors on flights to that Naval Air Station. Many came home, learned to fly, and eventually bought airplanes.

The recent flight to our nation's capital by members of tne National Flying Farmer Association was a fine example of what can be done. The FF's who made that trip or one of the Navy Indoctrination Trips will not be putting their airplanes up for sale because airplanes as of the moment don't pay their way as farm tools.

Our second question—"To what extent does the airplane give you more leisure?"—brought a variety of answers. Straley Thorpe replied that the airplane could increase leisure over walking by 500 to 1. "The Indian walked," Thorpe said, "and it took a long time; the horse increased the pace, then came the automobile which increased the time for play by 100 per cent."

Albert Crane of Fennville, Mich., suggests that an airplane on the farm will be of much greater value if the wife and children are taken in on selecting places to go. Care should be taken to pick places that are educational as well as interesting, Crane says. He adds: "That is flying with a purpose."

On the subject of leisure, Fred Disosway doubts that an airplane on the farm brings any more leisure. "You are just as busy," he explains, "but the airplane enables you to go places you wouldn't even think of going by auto."

An honest summary of the survey indicates that Flying Farmers are here to stay. Whether the movement grows depends largely on three factors:

1. Places to go that are good. This will of necessity mean many more airports, with emphasis on landing strips near summer and winter resorts.

No. 2. Development of the airplane to where it can take its place as a profitable farm tool alongside the truck, the combine, etc.

No. 3. Cutting the overall cost of flying so more farmers learn to fly and buy planes.

Lower flying costs will also lessen the danger of smaller farmers becoming panicky every time the price of hogs takes a nose dive, to use just one commodity as an example. Overall, the picture is reasonably bright. END

Bill Renshaw, Flying Farmer columnist, lays a wreath at the monument to Korean war dead on the occasion of the dedication of Coles County (Ill.) Airport. At the left of the picture are Paul H. Douglas, U. S. Senator from Illinois; William G. Stratton, Governor of Illinois, and Norman Hannah, representative of the U. S. State Department.

"From Here to Eternity"

(Continued from page 16)

about 2,500 feet above sea level, and since there were many big trees around the barracks we had to be careful. Capt. George Harris, also of the 199th, was to fly the other T-6 and we were to make coordinated attacks as the Japanese had on December 7. Sweeping in from the southwest through Cole Cole Pass we were to buzz the area on strafing runs controlled by Major Bob Butler, our maintenance officer, in his radio jeep. He was with the technical staff relaying their instructions to us.

Soon we were in the air set for the attack. It was an odd feeling to be flying over the peaceful scene on this sunny Hawaiian day and to realize it must have looked just like this that fateful December 7! Bob's voice crackled on the radio, "O.K. to start your attacks." Peeling off from about 2,000 feet, we bored through the pass, coming in at about 70 feet over the barracks quadrangle. Suddenly, ahead on the ground, there appeared little puffs of earth and turf exactly in line with my plane's nose. I was "firing"—Wolfe and his boys were at work. Explosions I recognized as my "bombs" shook my plane. The war was on.

As we made our passes Burt Lancaster stood up, exposed to the flying fragments and firing a 30 calibre machine gun, air-cooled, mind you, and from the hip. Sounds impossible, but he did it. He's a rugged character.

The whole show went off without a hitch until the last scene. I came down in a screaming dive for what was to be my end as a Japanese airman and suddenly I was informed from the ground that Burt had "hit" me. I pulled a line releasing a bag filled with lamp black along the side of the fuselage. Banking sharply and down I pulled out behind some trees, barely clearing the ground. There was a loud explosion nearly under my cockpit. I remembered the effect being produced. A charge of TNT set off a couple of drums of gasoline and I was now a "ball of fire." The charge had been set off a split second too early and I felt as though I had received a direct hit. Wolfe was solicitous over my reaction to the near miss but I knew he was delighted over the scene.

The most interesting thing to watch was the planning and laying out of the explosives. They actually use TNT charges, placed at predetermined spots and wired to a central battery location. The machine gun bullet-striking-the-ground simulation was created by small charges of TNT set in the ground at intervals in the proposed line of flight of the aircraft. These were wired to the central battery location so Wolfe could set in motion his man-sized war by merely pushing a series of buttons.

If the motion picture camera was able to capture the action going on at Schofield Barracks that day I would say that "From Here To Eternity" will be a picture worth seeing. END

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

F-100 TEST-FLOWN

Prototype of the North American F-100 jet fighter, designed to fight at supersonic speeds, has completed initial test flights at Edwards Air Force Base, California. The swept-wing YF-100 *Super Sabre* was flown by George Welch, North American test pilot, who reported: "It does everything we hoped."

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

NEW TERMINAL FOR NEWARK

The opening of the new $8,500,000 Terminal Building at Newark (N.J.) Airport gives the metropolitan New York area its most splendid airport structure.

Five times larger than the building it replaces, the new terminal is a self-contained community sure to attract many thousands of visitors in addition to the airline passengers whose flights originate or terminate at Newark.

The exterior of the 576-foot-long terminal is light and dark grey brick. The interior is of red brick with marble columns, a lofty sky blue ceiling and gay touches of chartreuse to add a sunny note. A cantilevered roof permits an almost unbroken expanse of glass, two stories high, overlooking the field. One observation deck, 500 feet long and entirely glass enclosed, is inside the terminal, while a second open-air deck runs atop one of the two arcades leading from the terminal to the 16 aircraft loading gates.

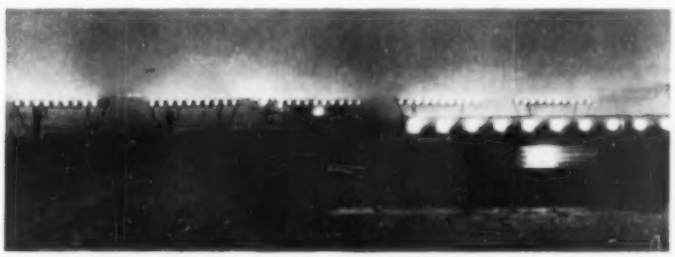
Speedy baggage handling, always a major airport headache, has received special attention. One of the enclosed passenger arcades dips down, underpass style, to allow baggage to move overhead unimpeded. The baggage area at the east end of the building is equipped with electrically operated treadles which permit baggage trucks to move with a minimum of delay.

Airline offices and ticket counters occupy 18,000 square feet below the enclosed observation deck, while the north side of the terminal houses such concessions as a bank, barbershop, bootblack, drug and cosmetic shop, book shop, Western Union, apparel shop, gift and hobby shops, newsstand and coffee shop. A cocktail lounge and bar is located at the foot of stairs leading to the Newarker Restaurant, where diners enjoy a sweeping view of the taxi strips and runways.

On a northeast-southwest line across the airport lies the $9,000,000 instrument runway opened last November. At that time, Newark Airport resumed the normal operations which were suspended following a series of plane crashes in the airport vicinity. The 7,000' x 200' runway, paralleling the Jersey Turnpike, is equipped with high powered approach lights, instrument landing system equipment and precision approach radar flight safety aids.

Newark Airport's former administration building was converted to an airmail and express building immediately following the opening of the new terminal, last July 29. The airport, which opened in 1928, celebrates its 25th anniversary this month. Since 1948 it has been operated by the Port of New York Authority, which also operates New York International, La-Guardia and Teterboro Airports.

Newark Airport is served by Allegheny, American, Eastern, Mohawk, TWA and United Air Lines, all scheduled carriers; by Flying Tiger Line, Riddle Aviation and Slick Airways, certified cargo carriers, and by a number of non-scheduled carriers.—*BRW.*



High intensity lights of new $9,000,000 instrument runway.

OPERATORS' CORNER

National Aviation Trades Association (NATA) is a service group that represents all service segments of the airport, fixed-base and air service operator. Its staff represents a federation of State Chapters and Members-At-Large. Its purpose is to fountainhead all activities of the American Operator, and to act as a sounding board for better public relations. Its aim: to improve air service operations and promote greater aircraft utilization.

Headquarters are located at 1346 Conn. Ave., N. W., Washington, D. C. Members receive a monthly "Washington News Letter" of confidential legislative and policy news in the making.

National Air Taxi Conference, same address, an affiliate of NATA, represents operators engaged in perfecting and standardizing a system of "through" air transportation.

Opinions expressed in this column are not necessarily those of FLYING Magazine.

BUSINESS HANGAR

A revolutionary type of hangar which will provide office as well as hangar space for each occupant is planned by Westair, Inc., fixed base operator at Westchester County Airport, N. Y.

An expandable, cantilever design, the structure features floor space clear of all obstructions. While the basic hangar can be built for $1 million, the cost of the Westair hangar will be about $1.7 million due to the addition of office space for each occupant.

This new service feature has unlimited possibilities, according to Tom Hintze, owner-manager of Westair. It means that firms with main offices in the city may quarter their entire sales force at the airport, occupying office space next to their aircraft and eliminating the problems of costly over-land travel to and from the airport.

Design of the hangar, patented by Erwin-Newman Co., and to be built by the Thompson Starrett Co., is substantially cheaper to construct than the conventional multi-bowstring hangar with spans of over 135 feet. It is pointed out that the floor space in a 280-foot section of the cantilever hangar will house two more DC-3's than a conventional hangar having the same area. Additional units can expand the structure to any desired length.

Success of the Westair hangar seems to be assured, with 25 corporations signed to house their planes in the new building. Sixty-five other corporations in the New York area have indicated an interest for future use of the office-hangar facility.

• • •

NEW MANAGER

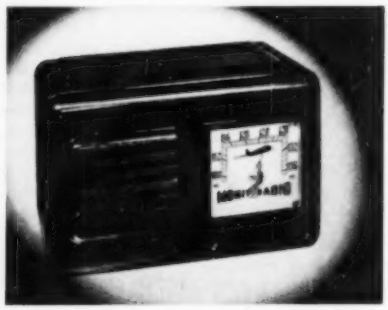
Donald R. McCann succeeds the late R. B. Kenty, NATA member, as manager of Air Associates Southwest Aviation Supplies Division in Dallas, Tex. McCann brings to his new position over 17 years of sales and merchandising experience with Air Associates. The division serves the aviation industry in Texas, New Mexico, Arkansas, Louisiana and Mississippi.

• • •

COMMUNICATIONS RECEIVERS

Efficiency in air service operations received a boost recently with the announcement, by Radio Apparatus Corp., that eight aircraft equipment distributors had been named to handle distribution of the company's new Monitoradio AR-4 and AR-5 communications receivers.

Both models receive control tower communications, emergency 121.5MC,



ground control, aircraft to CAA radio, aircraft to towers, aircraft to aircraft, Unicom, flying school stations, Air Force A, B, D, & H channels, CAA radio and approach control, airline communications.

Model AR-4, with 108-136 MC band, also receives ILS localizer, omni-ranges, and weather broadcasts. Model AR-5, with 118-149 MC band, receives Air Force C, E, F, and G channels, amateur band, and Civil Air Patrol.

With the new equipment, executive, administrative and operating personnel can be alerted constantly to immediate or pending demands in their sphere of operation.

Price of the receivers is $66.50. The Indianapolis firm lists the distributors as: Van Dusen Aircraft Supplies, The Don Horn Co., Aviation Supply Corp. of Florida, Piedmont Airlines, General Aircraft Supply Corp., Art Whitaker, General Aviation Supply Co., and Air Associates, Inc.

• • •

MECHANIC TRAINING UP

Contrary to reports from many sections of the country, the Casey Jones Academy of Aeronautics located at La Guardia Airport in New York, is showing a definite increase in enrollments for mechanic training. The cold, hard facts of the case are far from being of the miracle variety.

According to Jones, the increase in enrollments is the direct result of the school deciding to stop wasting their time trying to sell the government on contract training, and devoting their efforts to hard work and real selling. The Academy started its biggest spring class this year and believes that future enrollments will continue in the same trend.

• • •

FOR THE BULLETIN BOARD

This one is from "Rudder Flutter," monthly bulletin of the Idaho State Department of Aeronautics:

When you give it the gun in
the hot summer sun,
Every safe pilot knows that
the runway will shrink.
So make sure that the runway's
as long as the run,
Or you'll soon find the fence
haint as far as you think.

Baled hay helps pay airport expenses at the Lancaster, Pa., Municipal Airport. Using 169 acres of grass on the airport as an experimental area, the New Holland Machine Company, manufacturer of farm machinery, bales the hay as shown above and sells it to farmers. The Airport Authority gets the net profit—last year to the tune of $1,200 from the sale of hay. This year's harvest promises to be even greater as a result of the New Holland development program.

NAVIGATE WITH PRECISION AND EASE...

Enjoy positive, simplified navigation, whether you have an instrument rating or not. A Lear ADF gives you over 2500 stations to home on. Just tune to a station—quickly and automatically, the needle swings and points the direction to fly—plotting a fix is also just as quick and positive.

FOR SINGLE OR TWIN...

Whatever you are flying, you can now have a great new Lear ADF that meets your weight and performance requirements. Your Lear dealer will be happy to advise you which system is best suited to your needs. If you're buying a new plane, have your Lear ADF installed at the factory.

FERRO-DYNAMIC® LOOP!

Only Lear ADF's are equipped with this new brilliant performing, high-speed loop. It is more compact, has greater sensitivity, is completely enclosed in a molded housing, sealed against dust and moisture.

The ORIENTER® ADF-12

A combined ADF, three-band broadcast, radio range and communications receiver. Weighs less than 18 pounds and provides modulation and power for extra VHF transmitter.

The *Executive** ADF-14

Deluxe Model, rugged and dependable, well-suited for multi-engine planes. Has tuning meter, BFO—can be hooked to dual azimuth indicators. Sealed components, fungus-proofed.

*Trademark

ATTENTION PILOTS!

Send for ADF log—alphabetical listing of 2500 standard broadcast stations, range stations, radio beacons, ILS locators, and control towers—giving frequency, power, location, type, etc. Price $1.00.

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Leadership Demands Constant Achievement

Built to get there NOW!

F-94C Starfire combines defense with economy!

No fighter-interceptor can get into the air quicker, and none can climb faster than the Lockheed F-94C Starfire. This new all-weather interceptor for the U.S. Air Force is now defending key American cities from possible air attack. The Starfire was designed to reach target altitude in record time.

Combining greater flight availability and lower maintenance costs with superlative performance, the F-94C Starfire actually delivers more defense for your dollar.

Lockheed

AIRCRAFT CORPORATION

BURBANK, CALIFORNIA, AND MARIETTA, GEORGIA

Look to Lockheed for Leadership

Lockheed

Builds Plane No. 25,000 and Jet No. 5,000

Lockheed airplane Number 25,000 rolled off the production lines recently in Lockheed's Burbank, California, plant. Significantly, it was an F-94C Starfire Jet Interceptor, newest member of Lockheed's pioneering jet aircraft family. Later, another Lockheed Starfire became the 5,000th Lockheed jet to be built.

There's a reason for the quantity production of F-94C Starfires. Here's a military jet that does an outstanding job and saves money, too.

Here's How It Does It

Economy is important with the Air Force, and here's how the Starfire helps on the budget:

An economical airplane is one that performs its mission with greatest efficiency and offers maximum availability on the ready line. Maximum time between servicings means *lower maintenance costs*. More important, it means *fewer planes are needed*. The U.S.A.F. provides both types of economy with the Starfire.

2-Man Team Helps

Since the Lockheed Starfire is a 2-place interceptor, it utilizes the cooperative efficiency of a 2-man team to compute the tactical problem and perform all other split-second operations of intercepting an enemy at 600-mph-plus speeds.

This all-weather interceptor is equipped with automatic electronic controls — Hughes Radar System, Westinghouse Automatic Pilot, Sperry Zero Reader—and other advanced devices, making it very nearly an automatic airplane.

A "Pilot's Airplane"

Reports coming in from the field indicate that Lockheed has again produced a "pilot's airplane." Air Force pilots like the Starfire and like to fly it. They find it simple to fly and rock-steady under actual instrument conditions.

Here is the happy combination of 4 important factors in one reliable airplane: (1) Superlative performance — (2) Easy maintenance — (3) Pilot popularity — (4) More defense for your dollar.

Pros Join the Team

(Continued from page 31)

The CAA serves as the rescue coordinating agency in every case. Its personnel are in the best position generally to stand watch on the radio frequencies and to organize whatever military forces in the area are needed. So the basic rule in utilizing any of the described actions is to notify the nearest CAA station first and let them control the rescue or search.

For Instance

Here's a sample incident to demonstrate how well the military is tied into CAA operations. Let's assume a pilot is coming down the shore line from a fishing resort in southern Wisconsin toward Chicago. He bucks into a lake storm and gets off course.

He raises Chicago CAA radio and reports the nature of his difficulty. The station immediately calls for a search for the plane on the surveillance radar at Midway Airport and at the Glenview NAS.

We'll assume that the Navy radar detects a "blip" that they think is the lost plane. The CAA is still maintaining radio contact with the plane and relays the Navy's request that the plane make a series of identifying turns.

If the radar blip prescribes these, satisfactory identification is made and the Navy is ready to go into action. The Glenview tower can, for example, take over and bring the ship in by homing it in on their Direction Finders. This requires only that the pilot depress his radio transmitter switch intermittently. The tower men can get a bearing on their DF scope on this signal and tell the pilot what heading he needs.

If other nearby fields are closed in by weather and the pilot wants to set down, the Navy tower can then bring the ship in by GCA. A six-man GCA crew stands by 24 hours a day in their ready room just beneath the control tower at Glenview. An order from the Tower sends the men bolting for their truck across the rain-swept field to their GCA station.

In seconds, the men are at their posts, the powerful 50 hp diesels are turning over. The duty officer orders the radar "fired off." The ground observer takes his place alongside the runway and radio contact is established with the plane. Twenty-five different radio frequencies, from 200 kc to 350 mc can be worked from the GCA van.

The plane is first put on a vector to the field. Its progress inbound is plotted as the sweeping hand of the scope trails its phosphorescent path. The crew director watches the target in his search scope until it is brought within five miles of the field.

Then a shift is made from the search radar to the precision radar. The azimuth men, controllers, and two directors hunch over their respective screens. What the Navy calls "prescribed procedures" now begin. The first director talks the plane into the final leg of its landing by a series of altitude and heading changes. By means of interpretive readings of range, azimuth, and altitude the men can put the plane down within 10 feet azimuth and 20 feet elevation of the runway with an outside observer visually watching for the plane to break through and become visible.

Morell of the Story

The life-and-death value of these facilities was dramatically realized by one flying businessman, Victor Morell of New Britain, Conn. He was coming into Chicago from Toledo when he ran into a squall. His fuel was dangerously low and visibility dropped off to a quarter of a mile.

He immediately radioed a distress message. Then Glenview tower intercepted it and the GCA team went racing out to their truck. They picked up the plane on their search scope and through the CAA tower at Midway Airport (which Morell was monitoring) gave him a heading to the Naval Air Station.

A few minutes later, the Connecticut pilot saw "the most beautiful lights in the world"—the Aldis light flashing the green "go-ahead" signal. He put down in a break in the fog just as his engine conked out. The P.S. to this story is that the GCA crew has a new TV set in their ready room—courtesy of a very grateful Morell.

The CAA has DF stations, of course, and the Federal Communications Commission also operates HF/DF stations such as the one at Allegan, Mich. Air Force and Navy fields offer use of their UHF/DF stations and are equipped to take bearings on transmissions between 100 and 156 mg.

For all such emergency bearings, the pilot should call on the international distress frequency, 121.5 and listen for the DF station or CAA to reply on the same frequency. Except for this emergency frequency, the military VHF/DF stations do not maintain continuous watch on the civilian pilots' transmitting frequencies.

Yet even all these do not spell the limit of the electronic watchdogs. Under the Air Defense Command, an extensive network of secret radar stations are on constant watch for unidentified aircraft. Any craft flying over 4,000 ft. and not on a flight plan is subject to interception by jet fighters called out by one of these radar stations or a Ground Observer Corps spotter.

At the same time, both the radar posts and the civilian spotters are able to help locate lost aircraft. The CAA works with the Air Defense Command which can alert its network for such an assignment. Once a plane is observed by a post, the CAA can request that the Air Force track and vector it to a safe landing spot or put it back on course through CAA communications.

Should the plane be going down, the military are ready for that, too. A liaison officer from the Air Rescue Service is on constant duty at the headquarters of the 30th Air Division. The unit at Selfridge Field has Sikorsky H-5 and H-9 helicopters and Grumman S-16 tri-phibians standing by for duty. On orders, planes can be airborne and on the way to help within minutes of a distress call. END

AIRCRAFT OWNERS AND PILOTS ASSOCIATION

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is "To make flying more useful, less expensive, safer and more fun."

Headquarters address is Box 5960, Washington 14, D.C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.

TOWER FIGHT

With the sudden CAA order to shut down 18 control towers for reasons of economy, a storm of protest has blown up to an extent that the CAA has hastily set about considering the complete revision of the criteria they had been using for the justification of control towers.

The CAA's criteria—which had been in use unnoticed by the industry and users for more than two years until the economy program was announced—came under strong fire from AOPA after AOPA had obtained a copy and studied it. In a letter to Fred B. Lee (AOPA A1585), CAA administrator, AOPA commented on the criteria used by CAA for both justifying and eliminating towers:

"The key to this apparent discrimination appears to be the point system devised by the CAA for the scoring of towers. That system places many times the number of points on a single airline DC-3 movement as it does on a comparable privately-owned DC-3. And it is our impression that the sky would virtually have to be black with civil aircraft in order to warrant a CAA tower, so long as there were no airline operations there . . ."

Replying to AOPA's protest, Mr. Lee pointed out that the reason the CAA has leaned so heavily on the airlines in evaluating control towers is because the necessary statistics on airline operations are readily available, while comparable statistics on the rest of civil aviation are not. Commenting on that point, AOPA said:

". . . You put great stress on air carrier operations because they 'serve as an accurate index for all types of traffic,' and you base your criteria on airline operations because airline statistics are so easy to get. We are particularly intrigued by your statement that 'where a large volume of passenger traffic is generated which results in a high scheduled air carrier activity, a correspondingly high volume of itinerant and local traffic also will exist.'

"That may very well be true when you are considering the establishment of a new tower. But how can such a rule-of-thumb possibly be used fairly when it comes to determining what towers to shut down? How can that rule be used fairly in the case of the Baltimore Harbor and Westchester County towers, where scheduled air carrier is practically non-existent, yet the towers' actual traffic counts are quite high—much higher than many other towers being retained by CAA? . . ."

In studying the problem, AOPA found that towers like those at Baltimore Harbor and Westchester County (New York) airports scored more than 8,000 plane movements each in one month, while many other towers around the country, with between 1,500 and 3,000 plane movements in the same month, were retained by CAA solely because they served the airlines. The Baltimore tower became ineligible under the CAA criteria when the airlines moved over to Baltimore's new Friendship airport. Westchester County airport has never had any substantial number of airline movements.

At present the Baltimore and Westchester County towers are being kept operating with local money. AOPA is continuing to press for a new criteria (which is already in the works), and reconsideration of those towers on the list of 18 that obviously should not be decommissioned on the basis of the volume of traffic they are handling daily.

AOPA ROUNDUP FLIGHT

The week-end of September 12-13 has been announced as the week-end on which AOPA's 1953 annual roundup flight will be held, again at Rehoboth Beach, Del.

INTERESTING AOPA FACTS

Besides offering AOPA members an unusually good deal in group life insurance ($5,000 coverage for $60 a year), the AOPA-Minnesota Mutual program has turned up some interesting vital statistics on AOPA members participating in the program. Examples:

About 50 per cent of enrollees in the program first soloed since the end of World War 2.

AOPA private pilots flew an average of 105 hours annually, commercial pilots reported an annual average of 255 hours. Both these figures are considerably higher than the averages reported by the CAA, and so widely used by the aviation industry.

The AOPA-Minnesota Mutual study included 3,450 men and 61 women.

PHONETIC FLIGHT SONG

Dudley J. Hill (AOPA 85555), of Washington, D. C., suggests this official song for the phonetic-alphabet fight:

"How Much is That Delta in the Window?"

"Which one of you is the automatic one?"

PICK A JOB WITH A FUTURE

CHECK WHAT YOU WANT IN A CAREER
GOOD PAY
OPPORTUNITY TO SEE FAR-A-WAY PLACES
SECURITY
RECOGNITION FOR A JOB WELL DONE
COMFORTABLE FAMILY LIVING
You get all these if you have the training and education that you can get at Spartan — quickly and economically.

Young men without training for a specific job have to take what is offered them. SPARTAN-trained men have companies bidding for their services often before their graduation. Since there is such a demand for SPARTAN-trained men, graduates can even select the part of the country in which they prefer to work and live. For those with adventurous spirits there are jobs in aviation that give travel in many foreign lands.

You can pick your job if you are well-trained in aviation and you are assured of being the best trained if you are a graduate from SPARTAN. You can get your training in the least possible time in this great internationally-famous school where you will meet students from many other countries.

You owe it to yourself to train for a successful career. Investigate what SPARTAN has to offer you. The best way is to pay a visit to the School. If this is not practical, write today for complete information.

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A UNIVERSITY OF AVIATION

SCHOOL of AERONAUTICS — MAXWELL W. BALFOUR, DIRECTOR
COLLEGE of ENGINEERING — ADDRESS DEPT. F-103

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Please send your free Catalog immediately.

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Indicate which of these branches interests you:

☐ Flight ☐ Flight Engineer
☐ Crop Dusting ☐ Instruments
☐ A. & E. Mechanics ☐ Link Instructor

Spartan is approved for training under the G. I. Bill of Rights

Readin', Writin' and RPM's

(Continued from page 21)

body of 1,790, aviation majors must take a variety of other courses which will better equip them both for living and for specific jobs. Three hours credit a semester is given for primary, advanced and commercial flight, for aeronautics and such courses as airline traffic. Rounding out the schedule of each student are basic courses in the humanities, social studies, consumer problems, marriage and the family.

Except for flight time, no extra fees are charged aviation majors. Advanced flight instruction in large planes runs about $12 per hour. Commercial and flight instructor courses cost $9 per hour. A "Try Your Wings" course is given students who wish to explore their interest in flying and is for five hours only. A solo course, at a cost of $125, takes a student through her solo work in flying.

The CAA-approved flight program at Stephens is keyed to the private pilot and encourages the family use of the airplane. Cross-country means a flight of 500 miles or more, and students often fly thousands of miles to their homes for vacations. Trips to the Kansas City and St. Louis airports are routine for the Stephens flight students.

Safety has long been the keynote of the Stephens program, with students now having completed 70,000 hours in the air without major accident. Insurance rates have dropped 27 per cent thanks to the safety record and practices. The team safety award given at the Intercollegiate Air Meet was won by Stephens in 1948, '49, '51, '52 and again in '53.

Licenses and Jobs

The results of the Stephens aviation program attest to the soundness of the principles on which it was founded. Seven hundred women have received private pilot's licenses. More than a thousand have completed the course in airline traffic. Each spring airline representatives come to the campus to interview members of the graduating class. As a result, Stephens students can be found in airline offices from coast to coast. The largest percentage of last year's graduates accepted jobs with TWA, American and Eastern. About 35 per cent of the graduates of recent years are working for TWA at this time.

Students who complete the course in airline traffic are given Certificates of Competence to fill such positions as reservations, control, passenger or travel agents. They also have the basic training for stewardess work.

Spring vacation is highlighted each year by college-sponsored air trips. The Columbia Travel and Service Co., Inc., located on the Stephens campus, arranges tours and serves as a working laboratory for students of airline traffic.

Students must have parental permission before taking flight courses or using college planes. Ten years ago, less than a third of the student body had this permission. Today, 90 per cent or above have it. END

CHALLENGE TO POWER PILOTS!

Soaring pilots measure their spot landings in inches from the center of the circle to the point where the nose of the ship comes to rest. During the National Soaring Contest at Elmira, N. Y. this year, the Schweizer 2-22 shown above with pilot C. J. Smith at the controls took second place with this landing. First place in the FLYING Magazine spot landing event went to Bill Frutchy with a distance of three inches from the flag!

National Soaring Champion for 1953 and recipient of the DuPont Trophy for highest point score for the 10-day meet was Dr. Paul B. MacCready, Jr., with 1,889 points.

A flight of 215 miles, from Elmira to Simsbury, Conn., won the Bendix Aviation Distance Trophy for Dr. MacCready. Second place went to Paul Schweizer with 204 miles to Hicksville, L. I., and third place was won by William H. Coverdale, Jr., with 193 miles to Woodlawn, Md. The Lewin B. Barringer Trophy for the best distance flight from other than plane tow was awarded to Paul Bickle for a flight of 160 miles.

The Gannett Trophy for fastest elapsed time to Rochester, N. Y., Airport went to MacCready with a time of 2:22 for the 80-mile distance. Also in the money for fastest time to Rochester for the Brace-Mueller-Huntley-Schweizer Award were Delbert W. Miller and Robert B. Smith.

American Women's Soaring Champion for 1953 was Betsy Woodward who received the Baylor Watch Award.

A flight from Elmira to Idlewild Airport by Stanley W. Smith won the National Airlines Award. The Donald Douglas Soaring Club Championship Trophy went to the Metropolitan Airhoppers Soaring Association of Wurtsboro, N. Y., with highest club point score.

For the outstanding contribution of the year to the art, sport and science of motorless flight, Ernest and Paul Schweizer were awarded the Warren E. Eaton Memorial Soaring Trophy.

During the 20th National Soaring Contest some 400 hours were logged in 28 sailplanes flown by 48 pilots, some of which are shown on the Harris Hill line below. A total of 9,713 miles were covered on flights of over 25 miles. —*CLH*

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Exciting flying! That's how George Milligan describes landing a light plane at night on a tiny mountain airstrip, with automobile headlights for runway markers. Founder and one of the pilots for the Medford, Oregon, "Mercy Flights" volunteer air ambulance service, he often has to land on makeshift runways in the Siskiyou, Cascade and Coast mountain ranges.

Like other pilots who fly over rugged terrain, he insists on every possible safety precaution. He's found that New RPM Aviation Oil eliminates pre-ignition and rough running due to lubrication, keeps engines running more dependably than ever before. And for worry-free power, they use only Chevron Aviation Gasoline 80/87.

"Since we've switched to Chevron 80/87," says Mr. Milligan, "we've never had trouble with detonation. Spark plugs stay clean, because it has less lead than higher octane fuels. And it gives plenty of extra power on take-offs—or whenever it's needed."

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TIP OF THE MONTH

It's a good idea to check your fuel strainers before each flight. Water in the strainers is a warning to drain the fuel tank to get rid of any other condensed moisture. If you keep the tank filled, you'll prevent excessive condensation.

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Souvenirs of Detroit

Highlight in the observance of the Fiftieth Anniversary of Powered Flight was the Sixth Annual International Aviation Exposition at the Detroit-Wayne Major Airport in Michigan in July. Above, seven Korean jet aces give a first-hand account of jet fighting tactics to Civil Air Patrol Cadet Dale Cramer. Left to right are: Lt. James F. Low, Major Frederick Blesse, Col. Richard Creighton, Capt. Manuel J. Fernandez, Cadet Cramer, Capt. "Hoot" Gibson, Col. Royal Baker and Capt. Joseph McConnell. Cadet Cramer was one of more than 600 Michigan CAP members who handled parking, communications and first aid assignments during the Detroit show. Below is a general view of the exhibit area.

Patrick Henry Airport

(Continued from page 36)

formation and flight plans, while radio navigational aid is supplied by the Langley Range Station, four and one-half miles east of Patrick Henry. Maps, charts and telephones are available at the field. Patrick Henry is equipped with a beacon and its name is printed atop the terminal building.

For travelers who elect to stay over in Williamsburg's guest houses, 20th Century hotels or 18th Century taverns, the airport provides free tie-down for 48 hours. Parking fees for longer periods start at $2 a week for single-engine craft up to 140 hp, increase to $3 a week for larger single-engine planes and are scaled at $4 a week for light twin-engine craft such as the Cessna, Piper and Beech.

No landing fees are charged private aircraft on pleasure flights. For people on business trips, the rates for all single-engine planes are $1 or a minimum gasoline purchase of 20 gallons; for light twin-engine craft, $2, or a minimum gasoline purchase of 75 gallons. Screw anchors in the sod are used for tie-downs. The field has a hangar but there is currently no space in it for transient craft.

Now the only commercial airport operating in the area, Patrick Henry occupies the site of a World War II port of embarkation, familiar to thousands of veterans as Camp Patrick Henry. The airport was opened in November, 1949, by the Peninsula Airport Commission and has been steadily expanded. END

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Performance of the A3D-1 is another example of Douglas leadership in aviation. Developing planes that can be produced in quantity—*to fly faster and farther with a bigger payload*—is the basic rule of Douglas design.

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Biggest Air Race

(Continued from page 19)

would receive at least a token inspection for airworthiness, whether or not it actually had to stop for fuel. The 48-hour requirement was to guarantee that the test would be completed within a given time and to give the pilots a chance to sit out unfavorable weather without jeopardizing their positions in the flying time category of the race. Each pilot had to keep a log-book on his ship, and the commanding officer of each base had to check each ship in and out on a log of his own. The commanders were selected on the basis of their judgment as flyers, and had the authority to delay or ground completely any pilot or plane they adjudged unfit to continue.

Aside from the eastern and western divisions, there were three separate classes of competition. The first was for the shortest elapsed time for the coast-to-coast flight regardless of actual flying time; the second for the shortest actual flying time; the third a handicap based on the rated top speed of each model entered. Of the 74 planes entered, 52 were de Havilland 4's with 400 hp Liberty engines. Forty-two of these were the notorious "Flaming Coffins," the Americanized version of the original British design, while the remaining 10 were DH-4B's, a greatly improved version that had been developed too late to be sent to the front. For handicapping purposes, the 124 mph top speed of the DH was set as the standard, and the slower types were given handicaps corresponding to their lower speeds. The total numbers of the various models entered, and their rated speeds, are given in the following table:

52	de Havilland 4	124 mph
7	S.E. 5 (British)	122 mph
5	Fokker D-7 (German)	117 mph
3	Le Pere C-11	124 mph
2	Martin MB-1	112 mph
1	Spad 13 (French)	122 mph
1	Thomas-Morse S-4C	100 mph
1	S.V.A. 5 (Italian)	Unknown
1	Bristol F.28 (British)	115 mph
1	de Havilland 9A (British)	128 mph

Since there were more DH-4's than any other type, they naturally drew the greatest share of technical criticism as the test progressed. The standard model was not at all popular with the crews—pilot and observer were separated by the gas tank, and in any crash the pilot was an almost certain casualty as the weight of tank and contents tore loose and pushed him into the engine. Another bad feature of the standard model was that the landing gear was located too far aft, resulting in many nose-overs when landing on soft ground. Some of the observers were well aware of this tendency, and corrected for the nose-heaviness by leaving the rear cockpit and crawling back along the top of the fuselage, sometimes all the way to the tail surfaces, during landings. This practice was so prevalent during the race that it was made the subject of strong comment in the official report made to the Chief of Air Service.

Another design shortcoming that put many DH-4's out of the race was a low point in the water line just ahead of the pilot's cockpit. This trapped some water when the radiator was drained at night, and the trapped water froze, splitting the line. This was not generally detected until hot water melted the ice after take-off, and the pilot's first indication of trouble was a steam bath. He was indeed lucky if he could land before all of his coolant was pumped overboard.

The major difference between the standard DH-4 and the B model was the rearrangement of the pilot's seat and the gas tank along the line of the later British DH-9A. This not only improved the pilot's visibility and his communication with the observer, but putting him behind the gas tank contributed immeasurably to his peace of mind. Other minor changes, including a relocation of the landing gear to stop the noseover tendency, resulted in a decidedly superior ship. The comparisons made between the standard and modified models during the test resulted in a major modification program, in which practically all of the U.S. Army's DH-4's were converted to DH-4B's.

The German Fokker D-7 fighters made a surprisingly good showing, even though only one of the five entered completed the race. Lt. Col. Harold E. Hartney, wartime commander of the famed First Pursuit Group, made the round trip. The ease with which this model could be serviced and maintained was already well known as one of its outstanding features. However, the rugged steel tube fuselage structure and the thick-section cantilever wings also demonstrated their advantages during the race by not getting out of rig as a result of hard flying, a problem that arose frequently with the wooden types. In crashes, the superiority of steel-tube construction was especially evident, and it is significant that this type of construction was specified for most American fighter types developed subsequent to the 1919 test.

One unforeseen advantage that the Fokker demonstrated during the race was the ability of its engine, designed to run

(*Continued on page 54*)

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

FLYING CANOE

Wilbur Wright agreed in 1909 to make an exhibition flight in a landplane from Governor's Island (off Manhattan Island, N. Y.), around the Statue of Liberty and up the Hudson River to Grant's Tomb.

It was only a few miles but Wright was going in low to give the public a good look at his flying machine and he was concerned over even a short overwater hop under the circumstances.

Between the plane's landing skids he lashed a canvas-covered canoe so he wouldn't sink—or at least not quite so fast—in the event of a ditching.

The flight was completed without incident.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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(Continued from page 52)

on low-grade wartime German fuel, to keep running on any farmer's tractor gas that could be obtained in an emergency. This feat could not be duplicated by the delicately tuned and highly temperamental Allied powerplants.

Then as now, considerable criticism was directed at the high fatality rate associated with air racing. Fifty-four crashes or forced landings were recorded during the test, seven of which were fatal to one or more occupants of the airplane. Many of the others were of such minor nature that the planes were able to continue the race.

Engine Problems

Engine trouble was the major cause of accidents, and 29 forced landings or crashes were attributed to this one item. Of 60 Liberty engines involved, only four completed the round trip without being replaced. The first and second place winners of the round trip event, both DH-4's, had undergone engine changes en route. Two SE-5's with 180 hp Hispano-Suiza engines of French design completed the round trip without extra change, as did the one Fokker D-7 and four DH-4's. Sources of trouble were many, ranging from defective spark plugs and ignition systems to improper lubricating oil and unfiltered gasoline. It was found that the Liberty was good for about 40 hours of average operation but, with careful nursing, would last 100 before needing a complete overhaul. Five ships were eliminated by overshooting the field and running through the fence or into the trees at the end of the runway. Another five spun in on landing approaches, and several received varying degrees of damage as a result of trying to land crosswind. Soft or rough ground took a toll, and at least one ship crashed while landing on perfect terrain as a result of not knowing that the axle had been broken during the preceding take-off.

While the ratio of crashes to airplanes participating was high, it must be remembered that this was an operation conducted with military aircraft not specifically designed for the mission they were flying, and that the pilots were flying a race and took chances and short cuts that would not ordinarily be a factor. In addition, the route offered no aids to navigation whatever, and there were no adequate maps. All the pilots were provided with Post Office Department maps prior to the flight, but these proved inadequate, as they showed only those railroads that carried the mail, and omitted some essential small towns, topographical features, and elevations entirely. Many of the pilots provided themselves with Rand-McNally state maps on their own, and found them better than the Post Office maps. However, in spite of these inadequacies, only two accidents resulted from pilots getting lost. Many wandered from the course but were able to find the next field or get back to the one they left.

No accidents were due to structural failure, undoubtedly the result of several machines having been grounded during the race by the field commanders because of structural deficiencies that could have resulted in accidents had they gone unchecked. One of the most unusual fatalities to occur in this race or any other was that which befell Master Sergeant Worth C. McClure, who fell off the top of a DH-4 fuselage when his pilot made a hard landing.

Maynard Wins

Of the 49 airplanes starting from Mineola, 26 reached the west coast, and seven of the 15 western starters reached the east coast. While a total of 33 planes made the one-way trip, only 17 elected to try for the round trip, and 10 made it. Top honors for the race went to First Lieut. Belvin W. Maynard, who covered the 2,701 miles from east to west in 25 hours, 16 minutes, 47 seconds of flying time to win this event. He also won the east-west elapsed time event and the east-west handicap, covering the distance in three days, six hours, 47 minutes. Turning his DH-4 around at San Francisco, he completed the round trip with his observer, Master Sgt. W. E. Klein, in 68 hours, 29 minutes, 58 seconds of flying time. While this was only good for third place in that event, his total of nine days, four hours, 26 minutes won him another first in the elapsed time event and second place in the handicap. Maynard's performance is all the more remarkable in view of the fact that he had a forced landing due to a broken crankshaft, but was able to change engines and continue the race in the same airplane.

Major Carl Spaatz, later to become Chief of the Air Corps, won the west-east elapsed time event in a DH-4 in three days, eight hours, 40 minutes. He was nosed out for first place in the west-east flying time event by Second Lieut. E. C. Kiel, who beat him by 17 minutes in another DH-4 with the time of 26 hours, 17 minutes, three seconds.

In spite of the fatalities and the unintended emphasis on the race angle, there is no disputing the fact that a great number of benefits were realized from the operation. While the DH-4 conversion program was a direct result, this was spread over several years. Of more immediate benefit to the country at large was the establishment of the key points of the transcontinental air mail route. The race made the cities along the way airplane conscious, and provided the incentive for the municipal action necessary to establish permanent airports.

Subsequent Army aircraft design was heavily influenced by the rugged test given to planes and equipment. Many of the desirable features of the Fokker D-7 were praised highly in the official reports, and found their way into other planes designed as many as 10 years later. Streamlined wire was tried for the first time on some of the DH-4B's, and soon proved its superiority over stranded cable, even though some of the planes so equipped were not allowed to enter because of different interpretations of the "standard aircraft" rule by officials at opposite ends of the line. The supply and spare parts system was also revamped when it was found that all of the tailskids for one model of airplane were stored in one part of the country and all the wings in another. END

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ALL PLANES ACCOUNTED FOR

By VIOLA GROSSMAN

"THIS IS ROCHESTER CALLING. PLANE NUMBER TWENTY SIX CRASH LANDED IN FIELD NEAR PALMYRA. PILOT HAS SLIGHT INJURIES . . . IS OUT OF RACE."

The words came from amateur radio station W2UTH, operated by the owner, Henry Blodgett, at the Rochester Airport. His was one of nearly 100 radio stations forming a chain 2,678 miles long across the country. These radio amateurs were in constant communication to insure the safety of contestants in the Seventh Annual TAR.

If you can imagine hunting a needle in a haystack, you have a fair idea of what the operation was like to these scattered radio operators. Keeping tabs on each movement of the 49 planes flying west was no small task.

The amateur radio network, which proved so helpful to TAR contestants when first used in 1952, was again organized by the writer, owner of W2JZX, East Rockaway, N. Y. As early as March 15, organization of the radio operators was underway. The result was a smoothly coordinated operation, even though widely scattered.

Portable radio stations were set up at each designated airport to broadcast the arrival and departure of the contestants. This information was retransmitted by a high powered amateur station on 3980 kc to the entire radio net across the country.

Night before take-off from Lawrence, weather reports of 70 mph winds kept the radio net alerted. Radio Station W1PFA, operated by William Loeffler, got weather reports from northeastern and western New York and along the route as far as Detroit, South Bend and Chicago. We kept the pilots informed of changes in the weather pattern.

On July 3, take-off was set for 10 a.m. Disturbing weather reports advanced it to noon . . . then to 2 p.m. By 1:55 all planes were warming up. Suddenly our radio chairman at Schenectady, N. Y. Airport, W2NAI, Marge Fisher, called in: "Hold up the flight. Weather report coming in. Doesn't look good."

That was it. High winds at Schenectady would make landings hazardous. Take-off was postponed to 5:30 a.m. next day. We wondered how many in our radio relay net would be on the air that early. To our surprise, at 5:10 a.m., July 4, everyone was checking in—key stations at Lawrence, Schenectady, Rochester, Detroit and South Bend, as well as in-between relay points throughout New York State, Pennsylvania and New Jersey.

Promptly at 5:30 a.m. Plane Number One was reported on runway. By 6:03, the 49 planes had left Lawrence. A short time later W1PFA transmitted a complete listing of the destination of each plane and ETA. Each station in the net "rogered" reception of the report.

Before it seemed possible, our chairman at Schenectady broke in with "Planes are now landing at Schenectady Airport." The net maintained silence, standing by for the reports as each plane either set down for refueling or radioed the tower that she was going on to Rochester. We all realized then that these pilots meant business and would try to make up for that lost day.

When all was cleared at Schenectady, word came from Rochester of the crash landing by Pilot Lindy Boyes. She had fuel line trouble and landed in a field near Palmyra. Ninety-Nines officials still at Lawrence got this report immediately for a receiver was set up for their monitoring use during the entire race.

Our net kept them informed on Lindy's condition when she arrived at Rochester and through the next day when she flew west to meet the girls at San Diego.

By 11:30 a.m., Rochester Chairman W2QAA, Arthur Haines, reported: "All planes have cleared Rochester." Activity moved to Detroit, South Bend and Peoria. The eastern portion of the net was closed, to resume a cross-country contact at 10 p.m. to exchange reports on weather and the whereabouts of each plane for the night. This was relayed to California, and the net closed down with the usual statement by W2JZX, net control station: "All planes accounted for."

This activity was repeated daily, from Peoria to Kansas City, to Wichita, to Amarillo, to Albuquerque, to Winslow, to Prescott, to Palm Springs and Long Beach. Most of the planes reached Long Beach by July 6.

The TAR Committee at Long Beach followed the race from east to west with a receiver set up on the frequency the net was operating on. One receiver at their headquarters and another in the lobby of the airport terminal kept everyone apprised of the progress. At Palm Springs there was no CAA operation, so the contestants and officials had to depend solely on flight instructions for the final leg to Long Beach. The net wound up its ham radio for weather reports and work at sundown, July 7.

Weather All the Way

(Continued from page 32)

lights trained on the ships, airport officials and countless helpers joined the pilots in digging holes, hauling rocks, packing in the wheels, steadying the wings against the blow.

Some slept the few remaining hours underneath their ships as the storm died and the long night ended. Worn and weary, all were at the field for the weather briefing by Mr. Tannenbaum of the Weather Bureau. Good weather was promised, but a take-off delay until noon was deemed advisable. Storms on the course would pass along.

By noon, further delay was suggested. Take-off was now set for 2 o'clock. By 2, ships were warming up and ready, crews loading, flags rushed to the Number One position. Patient crowds of spectators were lined up for the start. Then—orders to hold up the race. Winds up to 60 mph were reported at the first gas stop along the course. It would be impossible for the smaller craft to land there.

Ninety-nine disappointed pilots and co-pilots turned in for a bit of rest. By 3 a.m. they were up again and out at the field. Gratefully they accepted the gallons of hot coffee at hand as they once more readied their ships, maps and equipment. By daylight, all were warming up their planes, ready for take-off. At 5:30 Ship Number One moved into position, took over its log and started its take-off run as the flag dropped. Forty-nine planes rolled smoothly off in less than that many minutes. The 500 or more onlookers who had risen before dawn to see the take-off were rewarded by a nice performance.

Weather continued to play the heavy-handed villain, but the girls were good sports and relished the uncertainty, the rough air and the delays.

There was that first night in Peoria, when a barrage of lightning, wind and rain kept them all awake worrying about their ships. Next dawn they waited at the field in a torrential rain, listening alternately to weather reports and the crash of thunder. Above, the good luck promise of a bright rainbow glowed eerily against black clouds. Clearance was possible only after three hours of storm.

There was the late afternoon at Wichita, waiting to see if the inevitable headwinds were rising or subsiding. Dust clouds circled the field. The sock stood out, pointing derisively.

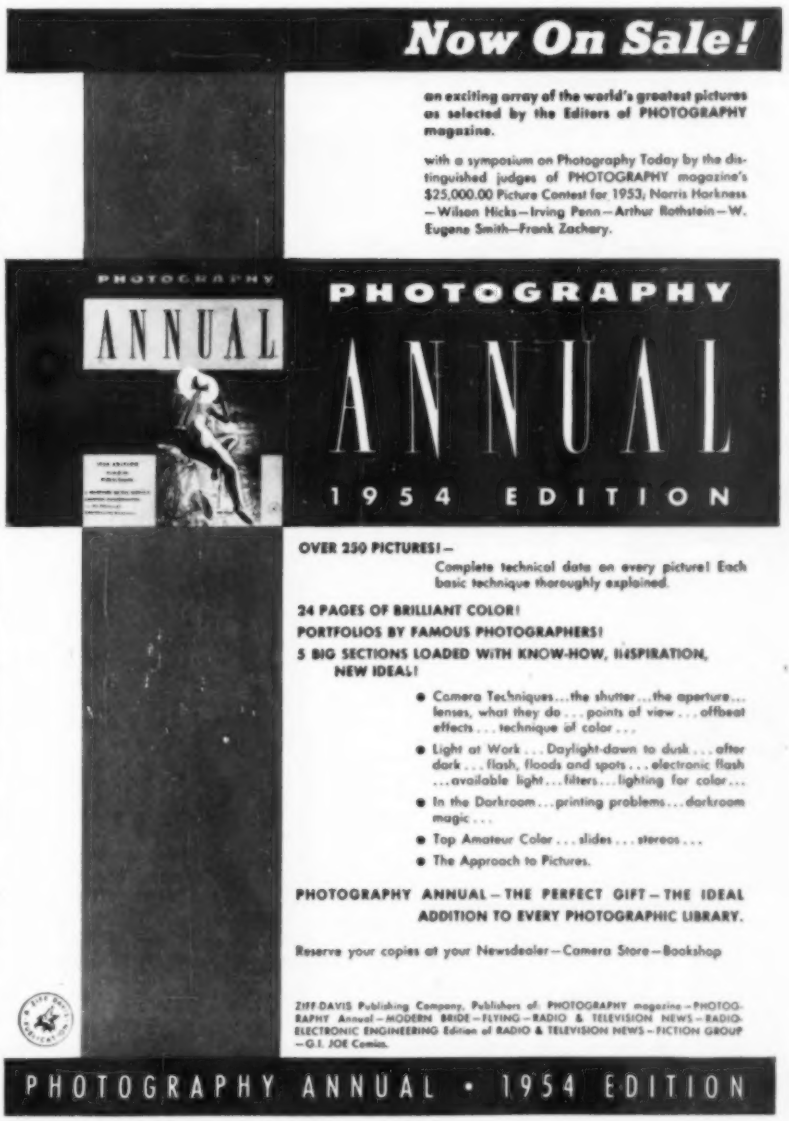
Then there was the broad southwest ahead; storms over rugged mountains; storms over New Mexico and Arizona. Faster, higher-powered ships had gone over and landed at Long Beach; slower, lighter planes were following far behind. Coming down at Winslow in a gale not meant for wide wings, taxiing was difficult. And more storms lay ahead.

There was the bright starlit hour before dawn as through the empty streets of Winslow kindly police drove TAR crews to the field. Take-off came as the sun crept over the mountains and the ships headed west again over the rugged ranges and down into the valley. The stop at Palm Springs was for gas and the final take-off, through the pass to Long Beach—there to call tower and buzz the finish line for the final timing.

When all the times were tabulated, and the handicaps applied, Frances Bera, who was co-pilot of the winning plane in the 1951 TAR, was declared winner. She and her co-pilot, Marcella Duke, flew a Stinson 108.

Second place was won by Jean Parker of Arcadia, Calif., in a Cessna 140, and third place went to Doris J. Eacret and Helen McIntosh of Elko, Nev., who flew a Cessna 140 *Patroller*.

Whatever the final rating, for all participants the cross-country dash was definitely habit-forming. We can hardly wait until next year. END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Pictorial Computers

(Continued from page 27)

Functioning of the Equipment

The working of the equipment depends upon three separate inputs. Information from the omni range receiver determines relative bearing between the aircraft and the station. Output of the distance measuring equipment (DME) conforms to the distance between the aircraft and the OBD station. Both outputs are converted to suitable proportional voltages and fed into separate servo loops which act in conjunction to position the reticles (and, consequently, the miniature aircraft and range circles) in accordance with the received bearing and range information. For each movement of the aircraft with respect to the OBD station, the reticle images are moved a proportional distance and in the same direction on the projected map. Magnetic heading is fed into the equipment from a Gyrosyn Compass to furnish the correct angular position of the heading arrow and "bug."

TAYLORCRAFT MEETING

Taylorcraft distributors and dealers from near and far journeyed to the factory at Conway, Pa., for the summer sales meeting. Here C. G. Taylor (center), designer of the *Cub* and all Taylorcraft planes and vice president of Taylorcraft, Inc., is shown with Eugenio Tizier (left) of Santiago, Chile, and Roy Hubert of Vancouver, Wash.

While the aircraft is in flight the information from the omni and DME is constantly changing. It is fed, together with the heading information, through the respective servos to control the movements of the range and "bug" reticles. Thus the miniature aircraft and the center of the range circles continuously follow the track of the aircraft and at any given instant are at the spot on the map corresponding to the position of the aircraft over the earth's surface. Likewise, the miniature aircraft and its heading arrow follow the heading of the aircraft at all times.

When the desired chart has been selected, the computer automatically tunes the associated omni bearing distance equipment to the proper ground facility and selects the corresponding chart scale in the DME servo unit.

This simultaneous tuning of the associated equipment (VOR and DME receivers) with chart selection is accomplished in a unique manner. Each chart in the film has associated with it 11 coded locations. These consist of holes or no holes in the film roll. As soon as a chart has been selected, mechanical fingers interrogate the coded locations. These fingers actuate relays within the amplifier unit which control the tuning of the omni receiver and the DME. Nine of the coded locations are used to tune automatically the omni and DME. The other two are used to set the scale of the DME to correspond to the chart scale. Thus, as each chart is selected, the omni receiver and DME in the aircraft are tuned to the OBD station located in the center of that chart. The range accuracy of the equipment is $\pm .4$ miles at all chart scales, while the bearing accuracy is $\pm 1\frac{1}{2}°$ or $\frac{1}{32}$", whichever is greater. Heading accuracy is $\pm 1°$.

Operation of Controls

Controls of the panel pictorial computer, located on the display unit, are relatively few and simple to operate. An ON-OFF toggle switch turns power on or off. A slewing handle, when pulled out and turned, energizes a motor which rotates the film roll thus changing the chart projected on the screen. Speed of rotation of the film is governed by the degree of turn of the slewing handle. Direction of rotation of the film, clockwise or counterclockwise, is governed by the direction in which the handle is turned. Maximum speed is 10 charts per second. Charts are numbered and indexed for the pilot so that he can select his chart and turn the selector handle in the proper direction and hold it until the desired chart number appears. Regardless of the position the handle is released in, the chart will center automatically.

Brightness of the projected image may be regulated by the brightness knob. The PULL knob, to the right of the screen, contains a spare lamp for the projector. When the knob is pulled out the spare is inserted inside the display unit. The knob remains out to remind the pilot to replace the spare lamp.

A flag alarm is also installed on the front panel of the display unit. A pop-up red flag warns the pilot when the inputs to the system are below the magnitude necessary for proper operation. This is the signal for the pilot to select the next chart, as indicated by the number at the rim of the chart then on the screen.

Navigation

Navigating with the panel pictorial computer is simply a matter of selecting the proper chart of the area over which the flight is being conducted and flying the aircraft so that the "bug" follows the desired course on the chart.

If there were no wind, the magnetic course to the destination would be computed and the aircraft held on this heading. The miniature aircraft and the center of the range circles would then follow a straight line to the destination. However, since some wind is always present,

it must be corrected for. This is done with the panel pictorial computer by noting the drift of the aircraft, then crabbing into the wind the amount necessary to keep the destination at a constant bearing with respect to the aircraft.

For instance, if an aircraft were proceeding from Dayton, Ohio, to South Bend, Ind., the pilot would first select the Dayton OBD chart. As the aircraft progressed along its course, the computer would continuously calculate its position and display it upon the projected image of the area. As the aircraft moved off the chart the pilot would select the next chart en route and proceed in the same manner until his destination was reached. In the above example, the Dayton, Fort Wayne and South Bend charts would be used.

Charts are provided at four different scales as shown in the following table:

Scale	*Type*	*Chart Diameter*
1:2,000,000	DF Charts	274 miles
1:1,000,000	Route "	137 "
1:500,000	Sectional "	68.5 "
1:250,000	Local "	34.5 "

Special charts for the pictorial computer are being prepared by the U.S. Coast and Geodetic Survey in cooperation with the CAA. Drawn in black and halftones, the charts contrast with the heading and position indicators on the screen.

The entire device, display and amplifier units, weighs about 37 pounds and costs between $3,000-$4,000.

In addition to its obvious convenience and safety factors, numerous related uses of the panel pictorial computer are foreseen by partisans of this particular navigation aid. For example, a pilot given a certain holding pattern to fly while waiting to land can draw the pattern on the screen with a grease pencil, then simply keep the "bug" traveling along the desired line.

Military use of the computer in wartime might be made in this fashion—during daylight hours a reconnaissance plane would drop a portable omnirange transmitting unit at a known spot behind enemy lines. Utilizing these transmission signals (as long as the unit went undetected by the enemy), night bombers would be guided visually to their targets.

Along the airways or along the battlefront, the pictorial computer is another in the long line of developments to make all-weather flying safe and practical. With the perfection of this computer—and coming production models will incorporate a number of improvements—instrument flight will become nearly as safe and routine as visual flight.

Next time you're flying IFR, imagine yourself with such a device. You listen to the ball game for half an hour, then glance down at your pictorial computer, casually pick up your mike and advise: "Caldwell Omni, this is Piper seven seven zero, 37 miles directly east of your station, just over the intersection of Windy Creek and the B and O railroad tracks."

The only thing missing is the automatic alarm clock to remind you to phone in your position report. "Ho hum, wake me up when we're in the traffic pattern!" END

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POSTMASTER WINS AIR CRUISE

W. H. "Bill" Hinselman, postmaster of Winner, S. D., piloting a Beechcraft *Bonanza*, was first place winner in the first annual JayCee Transcontinental Handicap Air Cruise, from Philadelphia to Palm Springs. He and Mrs. Hinselman, who accompanied him on the flight, are shown above with two trophies presented them at Palm Springs—the first place trophy awarded by the Junior Chamber of Commerce, sponsors of the Air Cruise, and the other awarded by Beech Aircraft.

Hinselman's route included stops at Columbus, St. Louis, Tulsa, Wichita Falls, El Paso, Phoenix, then on to Palm Springs for a Hawaiian "Luau" and the awards ceremonies. At El Paso, the Hinselmans detoured to Las Cruces to attend a postmasters' convention, but this didn't affect their competitive standing in the air cruise.

Total flight time for the Hinselman *Bonanza* was 16:02½ hours, for an average speed of 160.3 mph. Gas consumption averaged 11 gph—somewhat high, according to Hinselman, because of his tendency to "pour on the coal" throughout the cruise. Base time for the trip, as set for the *Bonanza* by the cruise committee, was 18:18 hours. Thus the winning time was calculated at 113 per cent of base speed.

Looking back on the cruise, Hinselman finds that several factors worked in his favor, over and above the benefits of detailed advance planning and meticulous navigation. He says:

"The cruise committee figured an average headwind traveling west of 15 mph. This, I think, was as fair as they could make it, but the week of the race the headwinds averaged considerably higher than that except on the last day, the only day of easterly winds.

"It was evident that if the headwinds averaged higher than the 15 mph figure, it would give an advantage to the faster planes as it would not cut down as much percentagewise on their base speed as on the slower planes. On the other hand, had the wind averaged less than 15 mph, it would have given an advantage to the slower planes, as it would build up percentagewise on their base speed faster than on the planes with a higher speed.

"Altogether, I realize I must have received the 'breaks' along the line. In a long flight of that kind, you cannot afford to make any mistakes that would cost you time and I was fortunate in not having made any."

Oxygen Lack

(Continued from page 33)

help him out. "Okay, Johnny," I said, "here it comes." I turned it up a couple of notches.

About 15 minutes later, I asked him if his fingers had dropped off yet. He replied that they hadn't but that he was still cold, and could he have more oxygen, please. I turned it up a bit more. Later he was still complaining of cold hands, so I came down about 8,000 feet and left the oxygen on pretty high. By the time we landed, he wasn't complaining any more.

When we had climbed out of the aircraft, Johnny took me aside and asked if he could have a look at my oxygen mask. I gave it to him. He turned it over, then said: "I thought so, Skip. Look at this!" "This" was a hole in the supply tube.

"How did you know about *that*?" I asked.

"You told me."

"Nonsense."

"Yes you did. You didn't actually say anything about the tube, but you sure told me just the same. Man, you were prattling on up there like you'd never been on an op before. When Bill gave you courses, you didn't know which way to turn. That just ain't like you, Skip. Mostly you keep plain miserable and quiet, and you *don't* turn the wrong way. So I just figured you weren't gettin' the juice through."

"Thanks, Johnny," I said. "Lucky for us your hands got so cold, or we might not have got home."

Johnny looked embarrassed.

"Shucks, they never *was* cold," he said.

I thought a lot of Johnny for that, and I was pretty grateful.

It was a lot better than being clobbered on the head with a spanner. END

Russia's Secret Bomber?

(Continued from page 22)

scaled-down form, would add a strategic bombing weapon of frightening power to the Soviet armory. The three-view drawing, copied from the original German report, shows the basic layout as conceived by Dr. Saenger without even a cockpit indicated. The accompanying sketch is an impression of how the project might look in its developed form, the apparently inefficient fuselage shape being an essential part of the scheme. The wings have a triangular, wedge-type, aerofoil section with a maximum thickness of 1/20th of the chord two-thirds back, and sufficient area to bring the lightly loaded airframe in to a normal 90 mph landing when its fuel had been burned.

The Saenger-Bredt is really a two-stage rocket, the first stage consisting of a supersonic rocket catapult on the ground, intended to launch the aircraft along three kilometres of horizontal track, so that its speed builds up to about Mach 1.5 in approximately 11 seconds. At the end, the aircraft shoots into a 30° climb under the thrust of its own rockets to an altitude up to 500,000 feet, during which its speed increases to an estimated 13,000 mph.

The climb lasts between four and eight minutes during which the aircraft's 90 tons of fuel are consumed. The remaining 10 tons of airframe then flattens out and continues its flight in an undulating glide, skating along the atmosphere in the way that a flat stone "ducks and drakes" on water—hence the flat undersurface of the fuselage.

Solid Air

This may sound fantastic, but no test pilot will dispute the "solidity" of air at comparatively low sonic speeds. In Saenger's own words: "Because of its wings and the supporting properties of its fuselage, the aircraft, descending along a ballistic curve (after its rocket has stopped), will bounce on the lower layers of the air and then be thrown upward again. Each plunge into the denser air will result in part of the kinetic energy being consumed, so that the initially long jump will gradually become shorter, finally changing into even, gliding flight. At the same time, along the 12,000 miles of gliding trajectory, the flying speed will decrease from its high initial value to a normal landing speed."

So the Saenger-Bredt is no one-way expendable aircraft—the Great Circle route from North Russia to New York is only 4,000 miles long, and well within its range.

This, then, is the aircraft Russian designers have been ordered to produce. Russia may never get a practical Saenger-Bredt, but the speed with which Russian designers have produced first-class, swept-wing jet fighters and bombers should warn us against underestimating their capabilities. They may well find a way of combining Saenger's designs with the reality of V.2, to produce a winged and piloted rocket able to span half the globe in powered and gliding flight. Reliable German rocket experts considered this possible eight years ago. END

Front Line Express

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Air Academy

(Continued from page 15)

brought together and that the Air Academy is an immediate prospect.

That the Academy will be a restorative of broader general interest in aviation is the opinion of leaders in civil as well as military flying. Educators believe that such an Academy will not alone furnish the nation with a hard core of career airmen but will have an enlivening effect on civil aviation education. At the Air University, on whose faculty staff the writer serves, we have been at work for almost seven years on such phases of Academy planning as curriculum, student flight training, physical education, and scores of details involved in building an institution complete from a standing start.

Legislation thus far developed to make the Air Academy a reality does not mention any specific site and leaves that choice to the Secretary of the Air Force upon the approval of Congress. It can be reported that a survey board headed by General Carl A. Spaatz has considered more than 350 different locations. From this number seven have emerged as seeming most desirable. These seven are, Camp Beal, Cal.; Colorado Springs, Colo.; Madison, Ind.; Charlotte, N. C.; Grapevine, Texas; Grayson County, Texas and Randolph Air Force Base, Texas. These sites are only board recommendations and are in no way binding on Congress or the Secretary of the Air Force.

Once a site is chosen, it is contemplated that the campus will be constructed over a period of years. The greatest care must be exercised in this respect since the dynamic state of air development is such that no stretch of imagination can encompass ultimate requirements. In the founding days of West Point and Annapolis the world was of such an order that scant attention was paid to possible need for expansion. As a consequence those institutions grew like Topsy and have long faced vexatious restrictions in significant utilities. The planners of the Air Academy must not impose such burdens on the future generations.

Examples to Shun

We on the planning staff for the Air Academy, along with advisory civilian educators and architects, have had an eye-opening experience in our search for ideas and ideals. We have found efficient modern structures alongside ancient and revered firetraps on many campuses. We have found auditoriums seating thousands with parking for 50 cars; libraries grown so bulky that universities can store them only miles from the campus; engineering labs so confined that the use of modern machinery is impossible, and a hundred other paradoxes.

But now we are here in Mexico where they have built something great from scratch . . . where education has space and light and convenience and economy and beauty and utility and possibilities for expansion or modification for a hundred years to come. We feel that if our neighbors have achieved something here which is without precedent, our own aspirations are not idle.

Perhaps some of the running comments and observations our survey board has made here at University City would better reveal our problems and details of thinking than a more formalized analysis.

We agree that wherever the Academy is built, the architecture should blend with the landscape and conform to the traditions of the locale. We don't go for Gothic themes in the southwest, for example, nor California-Spanish in New England.

Built on a lava flow, much of the building stone of this place came from the ground on which the campus arose. It is in keeping with the location and culture, and of this we approve, even though we are not particularly taken by the modern style itself.

Plenty of Problems

But where would the airfield be at our Air Academy? Adjoining? On all sides of the base, as at Randolph? Some distance from the base to cut down noise disturbance for those in class or studying? We agree that the airfield should be an integral part of the Academy, but are far from agreement on where it should be placed with respect to other facilities. Our inspection of Mexico's university cannot help us much on that point.

How about class buildings? Shall they consist of a series of small cubicles for our planned sections of 14 cadets each? Or shall they be like new office buildings with adjustable partitions permitting a variety of room shapes and sizes? Won't curriculums change with time? How can plot design ease pedestrian and vehicular traffic problems?

What about athletic facilities, swimming pools, ball diamonds, playing fields? Surely we want Air Force cadets to have a well-rounded physical development and a playing knowledge of all sports. A leader of young American men finds this ability almost mandatory.

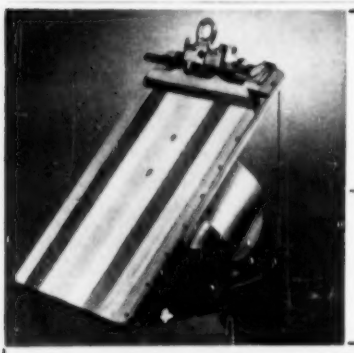
How about a stadium? Is this an essential feature for a modern American university? Do we want Air Force cadets to participate in intercollegiate sports? Is intense athletic competition a form of learning to be desired? Does it test courage and stamina? Certainly these are qualities we hope to nurture. Does it provide a focus for cadet unity? An outlet and relief from academic grind? Does it attract qualified young men to the school?

What kind of administration building will we need? Chapel? Hospital? Auditoriums and theaters? Where will staff and faculty live? Should most of them be housed on the base, as at West Point and Annapolis?

These and a host of related problems we kicked around hundreds of times before landing in Mexico City.

Twenty minutes on a divided four-lane boulevard brought us in sight of two 14-story towers of glass—administra-

(Continued on page 64)



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BELLANCA CRUISAIRS: 13 from $3300. November 1946, #7420JF, has 425 hours. 35 hours since top OH. Small fins. Primary blind. Aeromatic. Omni. Extras. Relicensed May. $3890. Also; November 1949, #652ZNF, with 175 hours. Heavy gear. Aeromatic. Gyros. Radio. Undamaged. Hangared. All bulletins. Exceptional. $4500.

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CESSNA TWINS: 6 from $2200. 300 HP Lycoming #6940GF is exceptional Executive. 665 total hours. Engines 10 hours since factory OH. New —9 propellers with spinners. Extra tank. Deluxe upholstery. Super soundproofing. Recovered 1951. Outside baggage door. Gyros. VHF. ADF. Hangared. Undamaged. All bulletins. $5550.

ERCOUPES: 6 available. 1948, #9477TF, has 350 hrs. Metal propeller. Radio. Extras. Undamaged. Hangared. $2000. Also; painted 1949 Club Air Model G, #9442RF, with 575 hrs., engine 50 since OH. Metal propeller. Jumpseat. Omni. Extras. $2950 with Omni, $2595 without.

GRUMMAN WIDGEONS: 3 available. G44, #2867QF, has modified hull. Engines zero since top OH. Recovered. Reupholstered. Relicensed. Metal propellers. Gyros. Omni. ADF. Many extras. Two spare engines. $20,000.

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NAVION 185'S & 205'S: 36 from $5000. Late 1947, #862ZHF, has 650 hrs., 67 since OH. New 170-hour 205 HP engine. Latest fuel system. Extra tank. Primary blind. Omni. ILS. Heater. Long stacks. Wheel fairings. Air conditioning. New tires. Tail modification. Bargain. $5500. Also; Ryan 1948, #435JKF, with 15 hour 205 HP factory remanufactured engine. Gyros. Loop. Extras. Beautiful. $7275.

NAVION SUPER 260'S: 12 from $11,400. 1950, #519XKF, has 102 hour factory rebuilt engine. Gyros. Omni. Hangared. Undamaged. $12,530.

PIPER CLIPPERS: 11 available. 1949, #527PHF, has 300 hours. Metal propeller. Radio. Extras. Relicensed April. Looks new. $2450.

PIPER PACERS: 16 from $3300. 1950, #698PKF, has 250 hours, engine 100 since OH. Metal propeller. Primary blind. Omni. Relicensed April. Excellent. $3500.

PIPER TRI-PACERS: 15 available. 1951, #61ZAF, has 304 hrs. Variable pitch propeller. Gyros. Radio. Undamaged. Hangared. Perfect. $4150.

STINSON 1948-49 165'S: 20 from $2800. #647QMF delivered new late 1949. 311 hrs. Skyblade prop. Airfoam seats. Plastic covers. Full blind. LF. Omni. Extras. Bargain. $3500.

SWIFT 125'S: 14 from $2000. 1949, #238PBF, has 540 hrs., 241 since OH and engine topped. Aeromatic. Spinner. New seat covers. Omni. Extras. Beautiful airplane. Bargain. $2600.

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(Continued from page 62)

tion and science buildings, we learned later. They lifted gracefully to the sky, sparkling reflected sunlight from every angle. Then the varicolored mosaic tower of the library stacks appeared. A moment later we were in the heart of the University, with odd-shaped structures on every side. None of us had expected anything on so grand a scale. Overcome by its magnificence, one of our party muttered something about a new wonder of the world, while another prophesied that it would change the whole Mexican culture and praised it as a great tribute to education.

One of the engineers on the project, Senor Aguerrebere, guided us around the network of one-way concrete strips similar to Pentagon approaches. The campus was laid out as three interconnecting islands—academic, student living and recreation, and faculty living areas. Tunnels and overpasses separate pedestrian and automobile traffic. Many buildings rest on concrete piles with no ground floor, permitting us to walk under and through them. We all agree that the circulation problem has been pretty well licked.

Our library expert marvels at the library which rises like a painted butte from a broad square base of glass-walled reading rooms.

Mammoth Stadium

You can get the idea of the stadium only from a picture. It holds 100,000 and is as graceful as a gondola. Its high curves put most spectators on the 50-yard line, while the cantilever construction of its overhanging stands gives it a large capacity. This idea is for us, I think, if the American public believes it to be a valuable feature of higher education.

For three days we have looked into every nook and cranny of the institution. We are captured by the designers' mood of freedom in the open buildings. Seen through the windowed sides, concrete pillars extend upward through the buildings, tied together by one floor after another. Such construction makes possible almost solid glass walls. Resting on stilts, the structures almost hang in the air. Such flying architecture might be applicable for our Air Academy. Symbolic of the new age, it would be built for the next two centuries, not the last two. The functional school combines the best of engineering art with architecture for a purpose. Its beauty is that of a suspension bridge or an airplane, not of a castle or fortress.

Since the University of Mexico is a national institution, we discern solutions to many problems likely to arise in building an Air Academy. Close teamwork is necessary between architects and teachers in the design of each building. Here, a high court of three members settled disagreements between architects and school consultants. Two members of the court, professors of architecture, understood the teachers' and architects' points of view. The third member was an engineer. The system assured continuity of style, yet permitted the utilitarian facilities desired.

Many Air Force officers will be asked to comment on architectural plans for the Air Academy. Some of these officers will constitute the faculty for this institution and will want it designed to best achieve the educational mission. A school like this will do more than educate and train good officers. It will go far in attracting outstanding young men to careers in the Air Force. It will be a symbol of our faith in the lasting nature of air power and the durability of the United States. END

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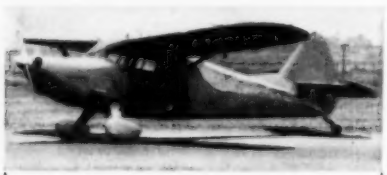

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Dust Is Their Destiny

(Continued from page 35)

whether sprays or dusts, grew longer. There were toxaphrene and parathion and tetraethylpyrophosphate.

Although the scientific jargon threw the average duster into a tailspin at first, the smart boys are now learning how to pull up and over scientific barriers.

The simple solution: team up with an entomologist.

One such successful combination is operating in California's agriculturally rich Imperial Valley.

Jim Vedder, former B-29 and B-17 pilot, is boss of the team's aviation end. Lloyd Ford, graduate in entomology from Colorado A&M, is the bug expert. Together, they are the Valley Insecticide Service Co.—Visco, for short. They operate five dusters and sprayers, hire two or three additional pilots in busy season, own two hangars and have an annual payroll running to $50,000. Jim and Lloyd are one of today's best examples of the marriage of convenience of agriculture and aviation.

"Take me," says Jim. "Before I teamed up with Lloyd I flew plenty of dusting missions over western fields. Right after I got out of service I dusted in Washington State. Keeping the plane in condition was a big job in itself. Yet I had to sell the farmers on dusting besides."

"Yeah," laughs Lloyd, "you knew your insects all right! How about the time you rushed in here with a handful of lady bird larvae and said they were eating up a client's field. Actually, lady bird bugs are about as beneficial an insect as a farmer can have."

That brings up a point. There's a precise right time to spray or dust a field. If you hit it too early, most of the insects aren't hatched and you don't clean them out. Hit them too late and the farmer may lose half his crop. The pilot just can't gauge —even with a fair amount of experience— when or if the field needs dusting. He can cost the farmer a lot of money, lose himself a client and earn a bad name.

Until Stepember, 1950, both Vedder and Ford were working for an agricultural chemical company. Jim was dusting; Lloyd was a company entomologist. One day they sat down to analyze what the farmer expects from a crop duster.

They reached these conclusions: first, the farmer must have confidence in the duster pilot. He must believe in the flyer's ability, must know that when the pilot says a field is completely covered it really is. The pilot must carefully watch adjacent fields to be sure the drift doesn't damage a neighbor's crops. He must have a certain science of his own. He must know which days to dust, during what hours he can legally spray which chemicals, and at what altitude each crop best takes sprays or dusts.

On the other hand, many farmers want consultation about their insect pests. Science often outstrips their knowledge, too, so the smart farmer calls in an entomologist to survey his fields and prescribe.

Taking these factors into account, Jim and Lloyd joined forces, agreed to split profits 50-50, and hung up their sign.

They made a small down-payment on two new cars. They bought a new ¾-ton stake pickup for $1,850 and a 1,000-gallon mixing tank for $1,500. For $4,500 they latched onto a surplus Stearman equipped with a spray rig and a 200-gallon tank together with an engine-driven pump. That first Stearman was powered by a 450 hp Wasp.

Jim and Lloyd divide the work. Jim keeps their five ships in shape, trucks in dusts and sprays needed for the next day's flights, and spots fields. Lloyd makes regular weekly visits to clients fields, taking "sweeps." A "sweep" means that Lloyd swishes a net back and forth among the alfalfa gathering nets-ful of insects. He counts the number of insects and determines the various species. The kind and number of insects, plus other factors, determine when a field needs spraying. Lloyd's services, incidentally, are "free." Visco quotes one price, which includes insect diagnosis. END

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FOR SALE: 1951 Cessna 195: 245 HP; 400 total hours; Cross-wind Gear; VHF; Omni; Gyros; Hangared. Brand new condition; One Owner. AOPA No. A93209; $12,500.00; Write Thompson & Harris, Philtower Building, Tulsa 3, Oklahoma.

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TWIN: 5-place, Licensed July 10, 1953; 60 hrs. since recover, engines 600 hrs. Baggage door, flares, etc., hangared, Company Ship. $3,900. Stockwell Mfg. Co., Greybull, Wyoming.

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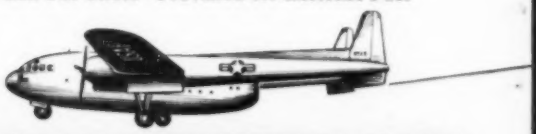

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